Category I Proposal Transmittal Sheet

Submit proposals to: Office of Academic Programs and Academic Assessment
110 Kerr Admin -- Oregon State University

For instructions, see http://oregonstate.edu/ap/curriculum/cati.html. Please attach Proposal, Library Evaluation (performed by the library), Liaison Correspondence, Faculty Curriculum Vitae, and Budget Sheets, as appropriate.

Check one:

Full Proposal
- [ ] New degree program
- [x] New certificate program or administrative unit
- [ ] Major change in existing program
- [ ] Establishment of a new College or Department

Abbreviated Proposal
- [ ] Rename of an academic program or unit
- [ ] Reorganization – moving responsibility for an academic program from one unit to another
- [ ] Merging or splitting an academic unit
- [ ] Termination of an academic program or unit
- [ ] Suspension or reactivation an academic program or unit

For proposals to establish a new center or institute, contact the Research Office (737-3437).

For requests to offer existing certificate and degree programs at new locations, use the New Location Request Form available on the Web: http://www.ous.edu/aca/aca-forms.html

Title of Proposal: 
Graduate Certificate in Management for Science Professionals

Effective Date: Fall 2008

Department/Program: 
College of Science

College: Science

I certify that the above proposal has been reviewed and approved by the appropriate Department and College committees:

[Signature] 5-14-08
Sign (Dept Chair/Head; Director) Date

[Signature] 5-15-08
Sign (Dean of College) Date

[Signature] [Signature]
Print (Department Chair/Head; Director) Print (Dean of College)
A New Instructional Program
for a Graduate Certificate in Management for Science Professionals

Revised January 2009
(major revisions underlined)

Oregon State University
College of Science

1. Certificate Program Overview

a. Proposed CIP number: 301801

b. Brief overview including description and rationale:

People working in science or science-related fields typically have received no formal training in management, communications, ethics or professional technical skills during their graduate study. However, a variety of individuals employed as researchers in managerial positions, small business owners, veterinarians, pharmacologists, private consultants, or government employees often need such skills to perform their everyday work. This 19-credit graduate certificate is designed specifically for science majors and mid-career professionals. Recipients of the certificate will successfully develop and manage private science-based practices in medicine and biology, effectively run research laboratories, broadly communicate with diverse groups of people, and think critically about the work in which they are engaged.

The courses required to earn the proposed graduate certificate are also required of all Professional Science Master’s (PSM) students at Oregon State University (OSU). The PSM is a unique science graduate degree because students are required to complete an internship in lieu of thesis research and take courses in communications, business management, and ethics in addition to disciplinary science courses. At OSU, PSM program options are currently offered in Applied Biotechnology, Applied Physics, Environmental Sciences, and Applied Systematics in Botany. Graduates better understand the applications of their science.

The Graduate Certificate in Management for Science Professionals consists of eight courses emphasizing four key topic areas:

- project management, finance, marketing and organizational principles (9 credits in which courses are taught sequentially),
- communications (3 credits),
- ethics (3 credits), and
- professional skills (4 credits taught over 3 terms).

An online version of this graduate certificate program is planned, which will:

- enable entire PSM programs at OSU to be offered via distance education,
- increase student recruitment, including non-PSM degree seeking students who may wish to earn the graduate certificate,
- create opportunities for curriculum sharing with other PSM programs in the U.S., and
- increase capacity to develop additional PSM degree programs at OSU.
Graduates of this certificate program will receive formal recognition for completing the professional training, which currently can only be achieved through an assemblage of disjointed courses or an intensive MBA Program.

c. When will the program be operational, if approved?

Fall 2009

2. Course of Study

a. Briefly describe proposed curriculum.

Course topics were developed based on feedback received from industry representatives during PSM program development workshops held at OSU in June 2001 and December 2003. Additional information from other universities, OSU students, non-governmental organizations, and government agencies obtained during annual workshops for the last several years has continued to upgrade and augment the curriculum.

We are requesting a new course designator (PSM). The Graduate Certificate consists of 19 credits:

- PSM 565 Accounting and Finance for Scientists (3 credits)
- PSM 566 Management and Marketing Scientific Technologies (3 credits)
- PSM 567 Innovation Management (3 credits)
- COMM 550 Communication and the Practice of Science (3 credits)
- PHL 547 Research Ethics (3 credits)
- PSM 511 Professional Skills I (1 credit)
- PSM 512 Professional Skills II (1 credit)
- PSM 513 Professional Skills III (2 credits)

b. Describe new courses; include proposed course numbers, titles, credit hours, and course descriptions.

Existing courses include Communication and the Practice of Science (COMM 550), which is currently offered under Topics in Speech Communication through the Department of Speech Communication (COMM 512). Research Ethics (PHL 547) is currently offered through the Department of Philosophy.

Management classes (PSM 565, 566, 567) are specially designed for science majors to provide a practical understanding of business skills in accounting, marketing and entrepreneurship that will be useful in the workplace. The Professional Skills series (PSM 511, 512, 513) evolved to address a variety of specific training needs identified by both graduate students and employers, and importantly serve to integrate the diverse knowledge bases grounded in science and management that these students acquire.

Complete descriptions of all courses for the PSM certificate are attached as Appendix A.

c. Provide a discussion of any non-traditional learning modes to be utilized in the new courses, including, but not limited to: 1) the role of technology, 2) the use of career development activities such as internships.
An online version of this graduate certificate will be offered, and a development grant from e-campus has already been awarded pending approval of this Category I proposal. The ability to offer the certificate on-line will significantly increase student access beyond the OSU campus and create opportunities for curriculum-sharing with other universities interested in developing complementary professional programs of study.

The Graduate Certificate in Management for Science Professionals fosters career development and expansion of scientific skills to produce graduates capable of effectively and productively interacting with co-workers in business and scientific fields. The management courses were designed after careful consideration regarding content, learning sequence, and presentation style. Professors and students at five universities that also offer PSM programs with professional training components were visited in 2004 and queried about teaching style and learning effectiveness. Integration, synthesis, and application characterize successful teaching methods, particularly when educating science-based students in business concepts. Integrative learning occurs when students are asked questions like, “Which company would you buy stock in?” Answering such questions requires them to understand financial statements, market trends, leveraging, and other business concepts, not typically taught to science-based students. There is a steep learning gradient that exists as students progress from didactic lectures to demonstrations and finally hands-on learning opportunities. When students work in teams on various projects, they must synthesize their communication, business, and scientific skills.

The PSM 511 class requires students to complete service learning projects (examples in Appendix B), which engage them in their communities and create opportunities to apply their skills and interests in meaningful ways. Students determine the duration, breadth and depth of their individual projects. In PSM 512, students create individual professional multi-media portfolios. They are also introduced to foundations of career development concepts and skills. The PSM 513 spring-term course is designed around case study projects, which serve as integrative experiences where students apply their collective business, communication, and scientific skills. These projects are developed and mentored by working professionals from various organizations and disciplines (examples in Appendix B). Student teams develop project management plans, work together to solve real-time problems, and then share results through final reports and on-site presentations.

Unlike most graduate-level courses, comprised of similar discipline-cohorts, this certificate program includes students representing a wide range of science-based careers. It sets the stage for interdisciplinary communication and broad-based learning opportunities.

d. What specific learning outcomes will be achieved by students who complete this course of study?

Certificate graduates will have an understanding of:

- Basic concepts in practical accounting and finance, marketing, project management, and entrepreneurship,
- Interpersonal and organizational communication styles,
- Ethical issues in scientific and social settings, and
- How to apply scientific knowledge in a variety of settings and by working as part of a multi-disciplinary team.
Specific course learning outcomes include students' ability to:

**PSM 565: Accounting and Finance for Scientists**
- Apply fundamental accounting principles for different types of organizations and interpreting financial statements of these organizations
- Use activity-based cost analysis and performance measurement analytics
- Follow business cycle fluctuations, free market dynamics, and inflation trends

**PSM 566: Management and Marketing Scientific Technologies**
- Draft a project management plan that includes work breakdown structures, time and cost components, project control and quality parameters
- Adapt marketing concepts (research, target positioning, pricing, and methods of promotion) to develop new products or services

**PSM 567: Innovation Management**
- Develop a business plan to commercialize a new technology, product or service
- Structure small business enterprises and non-profit organizations
- Apply sustainable business practices

**COMM 512: Communication and the Practice of Science**
- Write and give presentations on various topics to diverse audiences
- Work effectively in teams, engage in collaborative decision-making, and negotiate
- Engage in different styles of interpersonal communication and understand organizational communication strategies

**PHL 547: Research Ethics**
- Adapt problem-solving methodologies to deal with ethical issues in scientific, business, and social settings
- Explore organizational business and cultural values and how they affect the practice of science and conservation
- Apply guidelines relating to patent, trademark, copyright, and authorship issues

**PSM 511: Professional Skills**
- Be an effective, adaptable speaker through repeat formal peer-evaluation
- Draft effective professional written communications through a group process
- Connect with local communities in ways that utilize and integrate professional and scientific skills and interests

**PSM 512: Professional Skills**
- Lead working teams in a variety of scientific settings
- Write effective job descriptions as well as conduct and participate in job interviews
- Create basic professional communication pieces

**PSM 513: Professional Skills**
- Draft effective project management plans
- Integrate and apply scientific, business management, and ethics training in team-based projects
- Communicate effectively across science disciplines

**e. Is there a maximum time allowed for a student to complete this program? If so, please explain.**
Students can work through the program in a timeframe that fits their own schedule, although ideally they will complete the certificate in one academic year, working with the same cohort of students. Individuals will be bound by normal Graduate School guidelines and timelines (e.g., completing a Master’s degree within a 7-year time period).

3. Accreditation of the Program

a. If applicable, identify any accrediting body or professional society that has established standards in the area in which the proposed program lies.

There is currently no organization that accredits this type of graduate certificate.

b. If applicable, does the proposed program meet professional accreditation standards?

N/A

4. Evidence of Need

a. What evidence does the institution have of need for the program? Please be explicit.

The PSM degrees at OSU (http://psm.science.oregonstate.edu) require courses currently offered through the proposed graduate certificate, and clearly address the needs recognized and articulated by key organizations like the Alfred P. Sloan Foundation and the Council of Graduate Schools (CGS) (http://scienccmeters.com/), see below.

The Graduate Certificate in Management for Science Professionals packages the additional training (also known as “plus” courses) provided in the PSM degree. Students majoring in scientific disciplines are drawn to these types of courses because they recognize how the training enhances their career options by adding value and versatility to their skills-base. We receive at least 10 to 12 inquiries per year from students interested in taking the “plus” PSM courses. Letters of support for this graduate certificate from the Dean of the College of Forestry and Associate Dean of the College of Agricultural Sciences (Appendix C) indicate interest from these scientific disciplines. Veterinary and pharmacy students also benefit from this training; however, their heavy course loads preclude their participation until graduation.

As an online option, this graduate certificate represents another step towards making entire PSM degree programs available via distance education.

b. Identify statewide and institutional service-area employment needs the proposed program would assist in filling. Is there evidence of regional or national need for additional qualified individuals such as the proposed program would produce? If yes, please specify.

Over 8 years ago, the Alfred P. Sloan Foundation provided seed money for development of PSM degrees at major universities. OSU was one of the grant recipients. These non-thesis Master of Science degrees emphasize interdisciplinary studies that integrate natural sciences and mathematics with training in management, communication, and
professionalism. Students acquire skills in analytical thinking, problem solving, and gain real-world experience through internships. Packaging the professional plus courses as a graduate certificate program will: 1) allow us to access e-campus funds to convert this curriculum into a distance learning option, 2) facilitate development of entire online PSM programs at OSU, 3) increase access to this training opportunity among working science professionals as well as PSM students at other universities, and 4) help recover costs for delivery of these courses through increased tuition revenues.

The value of PSM programs have been recognized by different organizations through time. A quote from USA Today (19 July 2004, cover story) summarizes the PSM degree in this way:

"The PSM is being called the MBA for scientists and mathematicians. It's an education aimed at future managers who will be able to move comfortably in the business of science..."

The CGS' report "Graduate Education: The Backbone of American Competitiveness and Innovation" (26 April 2007) recommends:

"...support for innovative graduate education programs, such as professional master's degrees, which respond to workforce needs..." (http://www.cgsnet.org/portals/0/pdf/GR_GradEdAmComp_0407.pdf).

There is a regional and national need to provide this type of training to people with careers in science and mathematics. Organizations need people who are comfortable in the worlds of both science and business; graduates will be better able to contribute to running private veterinary or medical practices, managing small science-based start-ups, or serving in managerial research positions for larger companies or agencies. Letters of support for this graduate certificate come from a variety of government agencies, industries, and small businesses interested in hiring these graduates and attest to this need (Appendix C).

Oregon was recently chosen as one of five states to participate in the "National Governor's Association Policy Academy on State Strategies to Meet Emerging Workforce Needs through the Professional Science Masters Program". The goals of the academy are to:

- Identify high-skills workforce gaps that PSM programs can help address,
- Assess the viability of implementing a statewide PSM strategy, and
- Create an action plan for a statewide PSM program that is linked to other ongoing Science, Technology, Engineering, and Mathematics related activities and programs at the K-12 and post-secondary level.

It is anticipated that this Graduate Certificate in Management for Science Professionals will be available in an online format in the fall of 2009 and could augment PSM program development at institutions across the state. A copy of Oregon's proposal (which further specifies service-area employment needs), letter of support from Governor Kulongoski, and letter of approval from the NGA are enclosed in Appendix D.

c. What are the numbers and characteristics of students to be served? What is the estimated number of graduates of the proposed program over the next five years? On what information are these projections based?

Currently, OSU accepts between 10-15 new PSM students annually into its Applied Systematics in Botany, Applied Physics, Environmental Sciences, and Applied
Biotechnology programs, and all of these students are required to complete the certificate program. More PSM programs in chemistry, fisheries and wildlife, alternative energies, and bioinformatics are envisioned and each should have capacity for approximately 10 students per year. Conservatively, we estimate that another 50 to 60 non-PSM students will register for the certificate each year (on campus and via distance education) in about 3 years, given that there are currently over 120 PSM programs offered at more than 60 universities across the U.S. (map below), and these programs potentially represent significant numbers of students interested in OSU's Certificate in Management for Science Professionals.

As an online option, PSM students from other universities gain access to OSU's “plus” curriculum required for their degree programs. In addition to professional training needs for new PSM programs developed at academic institutions in Oregon through the NGA initiative, PSM program directors from institutions in other states have also expressed an interest in OSU's professional PSM curriculum. The National PSM Association (NPSMA) recently conducted a Best Practices and Educational Metrics survey, which received responses from 40 universities representing 62 PSM programs. Survey respondents indicated a strong interest in curriculum sharing among institutions offering PSM degrees. Development of the “plus” training required has been a challenge for many institutions, which our certificate could easily overcome by sharing relevant courses via distance education. All PSM programs are required to have “plus” courses as defined by the CGS: http://sciemasters.com/portals/0/pdfs/Guidelines_for_PSM_Affiliation.pdf.

However, the Graduate Certificate in Management for Science Professionals would also be available to non-PSM students. Individuals who recently completed their undergraduate training often seek graduate degrees to learn additional skills. Others want to re-tool in their existing fields or advance in their current positions of employment. These students would all be able to register for this graduate certificate.

Traditional courses offered on campus have a capacity of approximately 20 students. Additional students can only be accepted if more sections are added. However,
significantly greater numbers of students could be accommodated through an online offering of the Graduate Certificate in Management for Science Professionals, as currently envisioned.

d. Are there any other compelling reasons for offering the program?

The Graduate Certificate in Management for Science Professionals is unique and addresses a compelling need in the field of science and mathematics.

Collectively, the classes that comprise the Graduate Certificate in Management for Science Professionals are offered at the graduate level, because they are designed for individuals who have already earned their undergraduate degree in science or math and are interested in advancing their careers through additional graduate level training. It is important to note that the business management series does not replace or comprise part of an MBA degree, just as other certificate components do not contribute to minors in specific topics (e.g., communication). However, we have found that many of our PSM students have heightened interest in certain topics after taking these professional courses, so that some choose to take additional communication courses and a few even earn an MBA after graduating with their master’s degree from a PSM program.

To acquire the skills this certificate offers, individuals in the past have had to cobble together coursework from a myriad of sources often spending more time than desired on specific topics. The Professional Skills series of courses perhaps represents the broadest array of disparate topics. To emulate the proposed curriculum, students would have to independently organize a variety of activities with different organizations and existing courses. Importantly, these students would not benefit from the collaborative processes involved such as peer evaluation nor would they have opportunities to integrate what they are learning through the projects required each term in the PSM Professional Skills series. The goal of the Graduate Certificate in Management for Science Professionals is to produce “T-shaped” individuals who have depth in a particular field of science or math and breadth in a variety of “plus” course topics that enable them to understand the applications of their work in science and function as versatile employees. As such, the PSM 511, 512, and 513 series of classes is offered at the graduate level because they integrate their content with topics applied to their training in science and math. Utilizing Bloom’s Taxonomy to compare graduate- versus undergraduate-level training, collectively these courses ask students to analyze (not just remember), evaluate (instead of simply understand), and create (versus merely apply) their knowledge so that they can adapt their skills to a variety of employment settings. By emphasizing a hands-on, integrative learning approach, students develop competence in all three learning domain structures (cognitive/knowledge; affective/attitude, and psychomotor/skills).

The PSM 565, 566 and 567 classes were similarly created from a stated need by employers of science master’s degree recipients. Graduates with an understanding of the business applications of their work in science are viewed as more valuable than traditional graduate degree holders. Multiple discussions contributed to the design of these classes, which cover key topics identified as important by employers. We needed to develop a few classes that would educate science and math majors in the basics of accounting, project management, marketing, and entrepreneurship, unlike the Master of Business and Engineering degree, which requires a minimum of 18 hours of credit in graduate level and 15 credit hours of pre-requisite course requirements in business administration (33 credits
total). We initially worked with the College of Business to design these courses but eventually decided to hire a special instructor who had earned graduate degrees in both science and business administration. This facilitated our goal of creating courses specifically for science and math majors.

As stated earlier, this certificate is designed at the graduate-level for individuals who have completed an undergraduate degree in science or mathematics, and these classes are part of the required curriculum for PSM students. Employers of science Master's graduates also emphasized the need for training in interpersonal and organizational communication, and COMM 550 is a class that evolved from those conversations. We worked with Gregg Walker, the previous Chair of the Department of Speech Communication, to include appropriate topics. New Media Communications is another department in the College of Liberal Arts designed to prepare students for a career in media, not in science. Course options in this program emphasize this perspective and would not meet the needs of the Graduate Certificate in Management for Science Professionals. Jeff Hale, the Director of New Media Communications, agreed that “The New Media Communications program does not have coursework that would be relevant to your students” (12 December 2008 email). Similarly, the Adult Education program “will prepare you to work either: as a development and training specialist... or as an instructional specialist and master teacher/trainer” and the Community College leadership Program “prepares faculty and administrators for leadership roles in technical and community colleges, higher education settings and similar organizations” (OSU website).

Our graduate certificate program is designed for science majors. We make students enrolled in the Environmental Sciences PSM program emphasizing environmental education aware of the Education Double Degree option, but this type of training is not in the focus of the general “plus” course training.

Importantly, precedents for this type of graduate-level training have been set at other universities throughout the U.S. and examples include:
- Michigan State University (http://grad.msu.edu/all/bus_mgt.htm),
- University of Utah (http://web.utah.edu/pmsc/coursework.html), and
- University at Buffalo (http://professionalmasters.cas.buffalo.edu/).

e. Identify any special interest in the program on the part of local or state groups (e.g., business, industry, agriculture, professional groups).

Special interest in the type of training offered through this graduate certificate has been expressed by numerous individuals, agencies, and organizations. A letter of support from Senator Ron Wyden (Appendix C) acknowledges that “the Graduate Certificate in Management for Science Professionals will enable individuals to bridge the gap between business and science in a variety of workforce sectors...” Congresswoman Darlene Hooley shares that opinion and offers that “expanding the PSM programs to include a Graduate Certificate will provide a wonderful opportunity for students outside the PSM program area who are interested in gaining critical professional skills.”

Professional associations such as Associated Oregon Industries (AOI), which represents more than 20,000 businesses in the state, and the Oregon Bioscience Association (OBA) are both strong proponents of OSU’s PSM program and the proposed graduate certificate. John Ledger, Vice President for External Affairs of AOI, and Bob Lanier, Executive Director of OBA, both serve on the OSU PSM Advisory Board.
Large and small businesses (e.g., Hewlett Packard, Chemica Technologies, Inc. and ViewPlus Technologies) are interested in the proposed Graduate Certificate in Management for Science Professionals, as are state government agencies (Oregon Department of Fish & Wildlife), and those affiliated with agriculture and forest industry sectors (see letters of support in Appendix C).

And finally, other academic institutions interested in developing new PSM programs through the NGA initiative are likely to have a strong interest in OSU’s Graduate Certificate in Management for Science Professionals.

f. **Discuss considerations given to making the complete program available for part-time, evening, weekend, and/or place bound students.**

The $75,000 grant from e-campus will help create an online version of the Graduate Certificate in Management for Science Professionals, thereby allowing access for individuals who would simply like to work on the certificate part-time (5-7 units/term to finish in one academic year) or full-time (in conjunction with another graduate program). Students would then be able to complete the certificate by working online whenever and wherever they currently live.

While exploring what types of teaching styles worked best for this type of curriculum and audience, we came across an excellent example of an online master’s degree program at Michigan State University. That program requires students (from all over the world) to gather on campus for 3-4 weeks at the beginning of their degree program to learn about challenging topics in person and meet and connect with one another. We plan to develop our online graduate certificate curriculum using a similar hybrid format.

5. **Similar Programs in the State**

a. **List all other closely related OUS programs.**

The Graduate Certificate in Management for Science Professionals provides an exposure in an applied approach to topics that are taught in-depth in all MBA programs. Currently no program exists for science majors like the one being proposed. Letters from Oregon state legislators, previously referenced, underscore the value of the Graduate Certificate in Management for Science Professionals.

In the Pacific Northwest, OSU is currently the only university offering PSM programs and this certificate is similarly unique.

b. **In what way, if any, will resources of other institutions (another OUS institution or institutions, community college, and/or private college/university) be shared in the proposed program?**

All resources necessary for the Graduate Certificate in Management for Science Professionals are located at OSU.

c. **Is there any projected impact on other institutions in terms of student enrollment and/or faculty workload?**
There are no projected impacts on other institutions in terms of student enrollment and/or faculty workload; however, as an online option, PSM students from other universities can gain access to OSU's “plus” curriculum, particularly if these courses are formally recognized by and transferable to their individual degree programs (see 4.c. above).

6. Resources

a. Identify program faculty, briefly describing each faculty member's expertise/specialization. Separate regular core faculty from faculty from other departments and adjuncts. Collect current vitae for all faculty, to be made available to reviewers upon request.

Core Faculty:

Gregory Kivenzor; College of Science, OSU (PSM 565, 566, 567)
  Instructor: Has graduate training and experience in both business management and science sufficient for teaching “plus” courses in accounting, management, marketing and entrepreneurship with applications in science-related fields (not accredited by the AACSB); will also assist with outreach and development of internship opportunities for OSU's PSM Program.

Gregg Walker; Speech Communications, OSU (COMM 512)
  Professor: Previous chair of the Department of Speech Communication, adjunct professor of Forest Resources, and Director of the Peace Studies program; teaches courses in conflict management, bargaining and negotiation, mediation, international negotiation, natural resources decision making, and peace studies; conducts training programs on collaborative decision making, designs collaborative public participation processes, facilitates collaborative learning community workshops about natural resource and environmental policy issues, and researches community-level collaboration efforts.

Jonathan Kaplan; Philosophy, OSU (PHL 547)
  Associate Professor: Explores the relationship between developmental and evolutionary biology, especially the importance of non-genetic heritable variations in developmental resources for evolutionary innovations; teaches biomedical ethics, scientific reasoning, philosophy of biology, and reasoning and writing.

Ursula Bechert; College of Science, OSU (PSM 511, 512, 513)
  Director of Off-Campus Programs: Teaches professional development courses for graduate science majors; directs development of PSM programs as well as international programs; research in reproductive biology of wildlife species, development of novel diagnostic and population management tools, nutritional and pharmacological studies; international collaborative research in southern Africa.

b. Estimate the number, rank, and background of new faculty members who would need to be added to initiate the proposed program in each of the first four years of the proposed program's operation (assuming the program develops as anticipated). What commitment does the institution make to meet these needs?
One new faculty member will be required to deliver this certificate program at OSU. This person will be hired as an instructor during the first year of the certificate. He/she should have a graduate degree (MS or PhD) in science and an MBA or formal training in business management. Work experience in industry, research and/or academia is desirable. In addition to teaching accounting, management, marketing and entrepreneurship with applications in science-related fields (PSM 565, 566, and 567), this individual will assist with outreach and development of internship opportunities for PSM students at OSU.

A letter from the Dean of the College of Science (Appendix E) confirms the institution’s commitment to meet this need. No other additional hires are needed for this certificate.

c. **Estimate the number and type of support staff needed, if any in each of the first four years of the program.**

No additional support staff will be needed to develop and deliver this certificate. A grant from e-campus ($75,000) will facilitate conversion of traditional courses to online options. Recruitment efforts will be folded into current PSM student recruitment activities. An existing 0.2 FTE PSM Coordinator position will assist with the student application process. Applicants need to have earned an undergraduate degree in a field of study in science or mathematics, and/or have been admitted to a PSM program.

d. **Describe the adequacy of student and faculty access to library and department resources that are relevant to the proposed program.**

Information can be readily accessed by students enrolled in the Certificate Management for Science Professionals Program on the OSU campus.

e. **How much, if any, additional financial support will be required to bring access to such reference materials to an appropriate level? How does the institution plan to acquire these needed resources?**

No further acquisitions are required. Reference material currently available is adequate.

f. **Identify any unique resources, beyond those on hand, necessary to offer this program. How does the institution propose that these additional resources will be provided?**

No unique resources are required.
APPENDICES

Appendix A: Course Descriptions

List of Proposed Courses:
PSM 511: Professional skills I (1 unit)
PSM 512: Professional skills II (1 unit)
PSM 513: Professional skills III (2 units)
COMM 512: Communication and the practice of science (3 units)
PHL 547: Research ethics (3 units)
PSM 565: Accounting and finance for scientists (3 units)
PSM 566: Management and marketing scientific technologies (3 units)
PSM 567: Innovation management (3 units)

Appendix B: Service-Learning and Case Study Project Examples

Appendix C: Letters of Support

Oregon State University
Sherman Bloomer, Dean, College of Science
Ilene Kleinsorge, Dean, College of Business and Sherman Bloomer, Dean, College of Science
Stella Coakley, Associate Dean, College of Agricultural Sciences
Hal Salwasser, Dean, College of Forestry
Mark Merickel, Associate Dean, Extended Campus
Courtney Campbell, Chair, and Jonathan Kaplan, Associate Professor, Dept. of Philosophy
Charlotte Headrick, Acting Chair, Department of Speech Communication
Jeffrey Hale, Assistant Dean, External Relations – College of Liberal Arts & Interim Director, New Media Communications

Government Representatives
Ron Wyden, U.S. Senator, Oregon
Darlene Hooley, State Representative, Oregon
Doris Matsui, State Representative, California
Jennifer Bond, Senior Advisor, Council on Competitiveness

Industry and Government Agency Advisors
John Ledger, Vice President of External Affairs, Associated Oregon Industries
Takuji Tsukamoto, President and CSO, Chemica Technologies, Inc.
Linda Amedo, Business Systems Manager, Hewlett-Packard Company
John Gardner, President, ViewPlus Technologies
Charlie Corrarino, Conservation and Recovery Program Manager, Oregon Department of Fish and Wildlife

Appendix D: NGA Proposal and Letters of Support and Approval

Appendix E: Budget

Appendix F: Instructor CVs
Appendix A: Course Descriptions

PSM 511: Professional Skills I (1 unit)

**Instructor:** Ursula Bechert  
**Offered:** Fall term

**Course description:** Students create their own multi-media portfolios, initially refocusing career goals and learning how to draft professional documents through a collaborative peer-review process. They practice public speaking, and initiate a service-learning project that engages them in the community and complements their scientific discipline.

**Approach:** The class meets weekly for one hour and provides students a chance to further focus their career goals through group discussions, networking, exploring potential employment opportunities, and completing a service-learning project. Students also learn through the process of evaluating each others’ work, engaging in reviews of professional documents, and providing objective feedback on presentations. Active learning integrates and applies knowledge to topics in science and math.

PSM 512: Professional Skills II (1 unit)

**Instructor:** Ursula Bechert  
**Offered:** Winter term

**Course description:** The course includes workshops on leadership, making working groups effective, and conducting and giving interviews. Students also develop their own multi-media portfolios and continue working on their service-learning projects, if they did not complete them fall term.

**Approach:** This class meets weekly for one hour and, through group discussions and individual tests, allows each student to explore the qualities that define their own style of leadership. Students learn team building techniques through experiential group activities that complement lectures. They also develop interview skills through opportunities to serve as both the interviewer and as the person being interviewed. Students use job descriptions they drafted based on personal career interests. Facilities at Career Services on the OSU campus are used to videotape interviews, giving each student unique insight into how they present themselves. Each student also learns how to create their own multi-media portfolio.

PSM 513: Professional Skills III (2 units)

**Instructor:** Ursula Bechert  
**Offered:** Spring term

**Course description:** The class provides an integrative learning experience by giving students opportunities to apply their collective management, communication, and scientific skills to real-time case study projects. These projects are developed and mentored by working professionals from various disciplines. Student teams work together to solve problems and share results through final reports and on-site presentations. One or two projects are completed per term, based on the amount of work involved per project.

**Approach:** The class meets weekly for two hours, and students are expected to work together outside class time based on project needs. Off-campus mentors initially make presentations and share background information about particular projects. Specific objectives are then addressed by the class working together. A project management plan, drafted by the students, further details individual responsibilities and guides team efforts. Project outputs include a final report and presentation.
Thus, students develop interdisciplinary communication and teamwork skills; enhance their creative
thinking, writing, presentation, and public speaking skills; build self-confidence by applying concepts
previously learned in separate classes; and further expand and integrate knowledge particularly with
respect to management and science. Guided team and self evaluations provide insightful feedback
for each student about his/her performance as a team member at the conclusion of the project.

COMM 512: Communication and the Practice of Science (3 units)

Instructor: Gregg Walker

Course description: Topics in this class include teamwork and collaborative decision-making;
interpersonal and organizational communication; writing for and making presentations to diverse
audiences; negotiation and consensus building; as well as persuasion and influence.

Approach:
The class meets twice weekly for 1½ hours to encourage discussions. Gregg Walker serves as the
lead instructor and four other faculty members contribute to the course based on their areas of
expertise. Students explore different communication styles and give a formal presentation at the end
of the term.

PHL 547: Research Ethics (3 units)

Instructor: Jonathan Kaplan

Course description: The course provides a basic understanding of: 1) responsible conduct in
scientific research (e.g., guidelines relating to patent, trademark, copyright, and authorship issues),
2) scientific ethics and corporate culture, and 3) cultural impacts on decision-making processes,
science, and societal values. In addition, the course covers recent trends such as the increased
politicalization of science and the difficulties engendered by particularly strong economic incentives
(e.g., start-up pharmaceutical and biotechnology companies).

Approach:
The class meets twice weekly for 1½ hours to encourage discussions. Various case studies, both
historical and recent, are used to introduce and illustrate particular kinds of ethical problems that
arise in scientific research and in the commercialization of particular kinds of results. Students
become familiar with ethical problems they might face in their professions, identify ethically
problematic situations, explain what aspects of those situations are ethically problematic, and then
explain why those situations are ethically problematic.

PSM 565: Accounting and Finance for Scientists (3 units)

Instructor: Gregory Kivenzor

Course description: The course frames accounting and financial issues, including the broader
environment in which a variety of enterprises operate (e.g., corporations to non-profit organizations).
Fundamental principles of accounting and financial analysis for different types of organizations are
covered. Lectures on micro- and macro-economics include inflation, business cycle fluctuations, and
free market dynamics.

Approach:
The class meets twice weekly for 1½ hours. Students are assigned to 3-4 person teams, based on
their different disciplinary backgrounds, to encourage communication skill-building opportunities. At
the beginning of the term, each team chooses a company that serves as a model to illustrate key
concepts (e.g., human resource management) that students explore through specific projects.
PSM 566: Management and Marketing Scientific Technologies (3 units)

Instructor: Gregory Kivenzor
Offered: Winter term

Course description: Project management emphasizes work breakdown structures, time and cost management, project control and quality, and human resources. Frameworks for management within a variety of entities (from non-profit organizations to large corporations) involved in science or science technologies are explored. Methods of market research, segmentation, target marketing and positioning, new product development, produce life cycles, pricing, and promotion and distribution are addressed. The importance of the global market and cultural factors that affect marketing strategies are included.

Approach:
The class meets twice weekly for 1½ hours. Students are assigned to 3-4 person teams based on their different disciplinary backgrounds to encourage communication skill-building opportunities. At the beginning of the term, each team chooses a company that serves as a model to illustrate key concepts (e.g., human resource management) that students explore through specific projects.

PSM 567: Innovation Management (3 units)

Instructor: Gregory Kivenzor
Offered: Spring term

Course description: Commercialization of new scientific technologies, products and processes, technology transfer mechanisms, entrepreneurship, and development of a business plan are key topics. Legal topics include intellectual property; structuring small business enterprises, partnerships and corporations; regulatory issues; and sustainable business practices. Other topics include intellectual property management, management of scientists and engineers, business assessment based on the triple-bottom-line, and actual commercialization of products and services.

Approach:
The class meets twice weekly for 1½ hours. Students are assigned to 3-4 person teams based on their different disciplinary backgrounds to encourage communication skill-building opportunities. At the beginning of the term, each team chooses a company that serves as a model to illustrate key concepts (e.g., human resource management) that students explore through specific projects.
Appendix B: Service-Learning and Case Study Project Examples

Previous examples of service-learning projects completed by PSM students include:
- Organization and promotion of the biofuels learning center: A team of PSM Applied Physics students collaborated with the OSU campus Biodiesel Initiative to develop a Biofuels Learning Center. The students defined the goals and organization of the Center, produced an informational brochure, and created a website for the Center.
- Education garden for Waldorf Elementary School: An Environmental Sciences PSM student wrote a proposal to make an education garden at a local K-8 school. The school accepted the proposal and granted space for the garden. A local nursery helped design and develop the garden, and future plans included securing outside funding for an onsite greenhouse.
- High school biotechnology curriculum: A team of Applied Biotechnology PSM students designed curriculum for high school students to help them learn more about biotechnology and genetic engineering, which they planned to offer through the OSU Saturday Academy.
- Conservation of the Fender’s Blue Butterfly: In cooperation with the Institute for Applied Ecology, a student in the Applied Systematics – Botany PSM program mentored four Philomath high school students throughout the year on habitat restoration projects to conserve the endangered Fender’s Blue Butterfly.

Some previous examples of case study projects are listed below:
- Black & Veatch, an environmental consulting firm, asked PSM students to create a business development plan to attract two new potential clients in the Portland OR and Vancouver WA region. Their final report and presentation were delivered at the Black & Veatch office in Lake Oswego.
- Anderson Risk Analysis, Inc. mentored students on a project conducted for the Salem Water/Wastewater Management Taskforce. The Taskforce and Mayor of Salem listened to the PSM students’ presentation on how Salem could reduce its mercury discharges into the Willamette River by 27 percent.
- Willamette National Forest challenged PSM students with two ethical case studies focused on the conservation of spotted frogs and spotted owls. Panel discussions were set-up by the students to share viewpoints and conservation plans of different stakeholders including the USGS, USFWS, ODFW, as well as members of the general public.
Appendix C: Letters of Support
Hi Gina:

Here's the exchange Ilene and I had about these courses at the end of April. I've copied her on his as well so she's aware we are going forward with implementation of the courses and the associated certificate.

Let me know if we need more documentation.

Thanks,
Sherm

Begin forwarded message:

From: "Kleinsorge, Ilene - COB" <Ilene.Kleinsorge@bus.oregonstate.edu>
Date: April 29, 2007 6:40:14 PM PDT
To: "Bloomer Sherman" <bloomers@science.oregonstate.edu>
Subject: RE: Professional Science Masters Curriculum

Sherm,

As long as this does not end up being a major but is a certificate, we have no problems with the proposed curriculum or offerings. I checked with AACSB last week and was encouraged to find that your plan would not cause problems for the COB. Of course they didn't understand why the resources were not available to the COB to deliver for you, but that is not in my control and I will not be held accountable for making it so.

Ilene

From: Bloomer Sherman [mailto:bloomers@science.oregonstate.edu]
To: Kleinsorge, Ilene - COB
Subject: Professional Science Masters Curriculum

Ilene:

Thanks for the conversation a couple weeks ago about the Professional Science Masters curriculum. I really do appreciate the efforts COB went to in exploring these courses and I also understand the difficulties they present.
My understanding is that COS will go ahead and work with Ecampus to develop and staff a three course series intended to familiarize STEM students with the key concepts they will encounter in the private or public sector workplace. I've attached a working outline of what those three courses might look like and how we would talk about the, so as to make it clear these are not business courses and not intended for anyone thinking about business as the focus of their professional career. I want to be very clear about who these are for and how we'll use them.

Let me know if this seems OK to work from. If so I'll get the next steps going for Fall and will keep you posted on where we are and how the courses are shaping up.

Many thanks,
Sherm
April 25, 2007

Dr. Ursula Beichert
Director of Off-Campus Programs
College of Science
Oregon State University
CAMPUS

Dear Dr. Beichert,

This letter is written in strong support of the Category I proposal for the development of a “Graduate Certificate in Management for Science Professionals.” As you know, I was the P.I. on the Alfred P. Sloan Foundation grant to Oregon State University (OSU) that resulted in the development of the Professional Science Masters Program at OSU. From my experience with the program, I have seen the value of offering the management opportunities to science students and believe that many more of our students could benefit from this aspect of the Professional Science Masters (PSM) Program. I am also aware of how other institutions have struggled (as we have) with establishing and sustaining the management aspect of this unique program.

I believe that developing a Graduate Certificate Program would allow non-PSM degree seeking students in other science-related disciplines to also benefit (e.g., veterinary students and veterinarians). By opening enrollment of this program to a broader audience, it should be possible to help recover costs of development and delivery of the management aspect. We know that other PSM programs are interested in curriculum sharing and that several will benefit from the certificate program once it is offered online. I understand that the online version will be developed as soon as the Category I proposal is approved and I believe that aspect will be of great value to our campus overall.

As you know, the College of Agricultural Sciences has been a partner in the development of the PSM programs and we see opportunities for additional units to be involved in these programs in the future. There is additional value in making the management related courses available online and in encouraging traditional thesis seeking Masters and Ph.D. students to obtain additional expertise in this area of professional development. We know from the experiences to date with developing the PSM program that just offering business courses developed for other purposes does not work well for the students.

In summary, I support the direction that you are taking with the Category I proposal to develop this new program. Please let me know if there are questions that arise about this proposal that I am able to answer.

Sincerely,

Stella Melugin Coakley
Associate Dean
23 April 2007

Dr. Ursula Bechert  
College of Science  
Oregon State University  
2082 Cordley Hall  
Corvallis OR 97331

Dear Dr. Bechert:

I support your proposal to create a Graduate Certificate Program in Management for Science Professionals, which springs from the Professional Science Master's (PSM) degree programs that you've been developing.

The College of Forestry sees real value in providing additional training opportunities in business management, communications, and ethics to students enrolled in our graduate programs. In fact, our on-line Sustainable Natural Resources curriculum is an elective option within the PSM degree in Environmental Sciences.

Graduates from the College of Forestry find employment with a variety of organizations, including federal and state natural resource agencies as well as private companies. The development of the additional skills that you describe in your proposal will make our students more competitive and versatile employees and natural resource managers. As we have begun looking into this type of opportunity ourselves, we encounter great interest throughout the region, nation, and world in the business and science courses that would be available in your program. Natural resource management is in the process of substantial change and a Graduate Certificate such as you propose would be extremely beneficial to forest and other natural resource managers.

You have our support in developing a Graduate Certificate Program in Management for Science Professionals at OSU.

Best wishes,

[Signature]

Hal Salwasser, Dean  
College of Forestry
DATE: May 21, 2007

TO:

**Ursula Bechert, DVM, PhD**  
Director of Off-Campus Programs  
College of Science  
Oregon State University  
DBPP- 2082 Cordley Hall  
Corvallis, OR 97331  
Tel: 541 737 5259  
Fax: 541 737 3573  
ursula.bechert@oregonstate.edu

**Sherman H. Bloomer, PhD**  
Dean, College of Science  
128 Kidder Hall  
Oregon State University  
Corvallis, OR 97331-4608  
Ph: 541-737-3877  
FAX: 541-737-1009  
Sherman. Bloomer @oregonstate.edu

FROM: Mark Merickel, PhD  
Associate Dean, OSU Extended Campus

SUBJECT: Letter of Support for Category 1 proposal, Graduate Certificate in Management for Science Professionals

OSU Extended Campus fully supports the establishment of an OSU Graduate Certificate in Management for Science Professionals. We have other highly successful programs for professionals in various fields of science, know how to market to this audience, and have established a reputation nationally for high quality, accessible courses and programs. Bringing this program to an extended audience nationally and internationally reinforces our goal of improving access to OSU programs.

The online version of this graduate certificate would be marketed nationally and would be of interest to students in other Professional Science Masters programs across the country. ( Nationwide program information—http://www.sciencemasters.com/). In addition, we anticipate enrollment in the individual courses by working professionals who are managing science programs and wish to upgrade their skills in core areas essential to their management success.

Upon curricular approval Ecampus will provide assistance with program planning, marketing, course design and development, Blackboard training, and supporting services
to students at no cost to the college or department and will return tuition revenue to the program according to the established Ecampus revenue-share model. We will support development of the online courses within this program by providing funding for the content provider for each course. With careful planning and with anticipated enrollment, this program will be self-sustaining under this model.
April 20, 2007

To whom it may concern:

We are writing in support of the Category I proposal to create a Graduate Certificate Program (19-credits), "Graduate Certificate in Management for Science Professionals," based on the Professional Science Masters (PSM) degree cohort curriculum.

As part of the PSM cohort curriculum, students are required to take Philosophy 547, "Research Ethics," which one of us (Jonathan Kaplan) has taught for the past two years. The response from the PSM students has been quite positive - the comments on the qualitative student evaluations this year included such remarks as "a great, thought-provoking class" "I really enjoyed this class even though I was a bit apprehensive about taking a philosophy course" and "very stimulating, relevant, and interesting." It is clear from these experiences in 547 that students from technical backgrounds have not been exposed to rigorous, sustained thinking about the ethical issues engendered by scientific research, and that, while initially skeptical of the value of such work, come to appreciate the importance of taking these kinds of issues seriously.

Creating a Graduate Certificate Program that, as part of preparing students in the sciences to work effectively in the private sector, includes a required ethics component, would benefit the OSU community in a number of ways: First, of course, those students taking advantage of the Certificate Program would benefit by gaining the expertise necessary to work effectively as both research scientists and business people, while maintaining a focus on the ethical issues inherent in their careers. Second, the businesses in which these students end up working will no doubt benefit by having hired people who have, at the very least, been asked to think seriously about what ethical conduct in research settings involves. And finally, such a program would send a strong message that ethical training, and ethical behavior, is a critical part of good management practice in the sciences, something that, unfortunately, has not always been seen as obvious, nor always practiced.

In short, the proposal to create a "Graduate Certificate in Management for Science Professionals" Graduate Certificate Program, based on the Professional Science Masters (PSM) degree cohort curriculum, is well worth supporting.

Sincerely,

Dr. Courtney Campbell, Department Chair, Philosophy Department
campbell@oregonstate.edu

Dr. Jonathan Kaplan, Associate Professor of Philosophy
Jonathan.Kaplan@oregonstate.edu
2 May 2007

Ursula Bechert, DVM, PhD
Director of Off-Campus Programs
College of Science
Oregon State University
DBPP- 2082 Cordley Hall
Corvallis, OR 97331

Dear Prof. Bechert:

The Department of Speech Communication supports the Category I proposal from the College of Science to create a Graduate Certificate Program in Management for Science Professionals which includes COMM 512-036, Communication and Practice of Science. We believe the inclusion of COMM 512-036 strengthens an already strong proposal. We will continue to teach this class as long as we continue to receive funding from the College of Science.

Sincerely,

Charlotte J. Headrick, Ph.D.
Prof., Theatre Arts
Acting Chair, Department of Speech Communication
Ursula, this looks like a wonderful applied program for professionals in scientific and technological fields. The New Media Communications program does not have coursework that would be relevant to your students. However, your program may be an option for our students that want to focus on scientific visualization as a career path in new media. We are supportive of your Cat I proposal and look forward to the implementation of this program.

Jeff
Jeffrey A. Hale
Assistant Dean, External Relations
Director, Liberal Studies
Interim Director, New Media Communications
211 Gilkey Hall
College of Liberal Arts
Oregon State University
541-737-4587
Fax 541-737-2434
jhale@oregonstate.edu

Hi Jeff,

Thanks for returning my call this morning. I appreciated your feedback regarding potential course overlap between your New Media Communications program and our Professional Science Master’s program (http://psm.science.oregonstate.edu/). Thanks for suggesting a reply to this email as a letter of liaison to acknowledge the lack of overlap and differences.

It looks like you’ve developed a wonderful program, and I really liked your website. Perhaps a few of your students might be interested in taking some of the professional courses we’ve created, especially if they’re planning to start or manage a media company. I hope that your Cat I proposal process goes smoothly.

Best wishes for the holidays-- Ursula

Ursula Bechert, DVM, PhD
Director of Off-Campus Programs
College of Science
Oregon State University
DBPP- 2082 Cordley Hall
Corvallis, OR 97331
Tel: 541 737 5259
Fax: 541 737 3573
E-mail: ursula.bechert@oregonstate.edu
Dr. Ursula Bechert
College of Science
Oregon State University
2082 Cordley Hall
Corvallis OR 97331

Dear Dr. Bechert:

It is a critical time for the United States. Everywhere we look, we see evidence of the global competition that American companies are facing. Unfortunately, we also see evidence that American companies are struggling because their employees lack the training necessary to compete in this global marketplace.

I am proud to say that the State of Oregon and the Oregon University system have been on the forefront in fighting to improve this situation. In particular, a tremendous amount of effort has been focused on ensuring Oregon's students get the math and science education, skills and knowledge that they will need to succeed. Oregon State University's Graduate Certificate Program in Management for Science Professionals is an important part of this effort.

This Graduate Certificate Program will help us become more competitive in science and math by providing individuals interested in working in science-related fields with training in business management, communications, ethics and professional technical skills. People working in research facilities, private practices or consulting firms, government agencies, and other industries often need such skills in their everyday work, but they have no way to acquire this training within their current professions. The Management for Science Professionals Graduate Certificate Program will enable individuals to bridge the gap between business and science in a variety of workforce sectors, and will arm their employers with the able workers needed to succeed in the 21st Century marketplace.

Oregon State University's Graduate Certificate Program in Management for Science Professionals should be applauded and emulated.

Sincerely,

Ron Wyden
United State Senator
April 25, 2007

Ursula Bechert D.V.M., Ph.D.
College of Science
Oregon State University
DBPP-2082 Cordley Hall
Corvallis, OR 97331

Dear Dr. Bechert:

I am excited to learn about Oregon State University’s success with the Professional Science Master’s (PSM) programs. I first learned of this program in 2005, when it was being developed. I have been a long time supporter of science based education and am encouraged to see this program growing.

Expanding the PSM programs to include a Graduate Certificate Program will provide a wonderful opportunity for students outside the PSM program area who are interested in gaining critical professional skills.

In this global economy, we should take every opportunity to arm our graduates with the tools they need to thrive and compete. We also compete at the university level for the best and brightest students and this program is one more way we can continue to recruit students to Oregon State University.

Thank you for keeping me informed about the growth of this exciting program. Please let me and my staff know how we can continue to support the important work you are doing.

Sincerely,

DARLENE HOOLEY
Member of Congress
May 8, 2007

Ms. Ursula Bechert  
Oregon State University  
2082 Cordley Hall  
Corvallis, Oregon 97331

Dear Ursula:

As a supporter of scientific research and increasing science, technology, engineering and math education in our nation’s schools, I wanted to update you on important developments in Washington.

Science and technology issues, such as global warming and alternative energy, are crucial to our nation’s competitiveness and security. As research into such pressing issues continues I believe our nation’s researchers should be encouraged to effectively communicate new discoveries to the public. That is why I am proud to report that the House of Representatives incorporated a program I introduced—the Scientific Communications Act of 2007 (H.R. 1453)—into the National Science Foundation reauthorization bill (H.R. 1867). This bill will create a NSF grant program to train science graduate students to communicate more effectively with policymakers, business leaders, and other non-scientists in order to capitalize on the federal government’s enormous annual investment in scientific research. I look forward to working with my colleagues in the Senate to ensure this legislation becomes law.

Late last month, the House also passed two bills that will advance STEM education and research in our country and ensure that the U.S. workforce remains competitive in the global economy. One of those bills, H.R. 362, will expand programs that help put qualified STEM teachers in our classrooms, improve teaching methods, and will create a panel of experts to identify and develop a new set of K-12 STEM curriculum for use in our public schools. Following the recommendations made in the National Academy of Sciences landmark report, Rising Above the Gathering Storm, H.R. 363 will strengthen the federal government’s long-term basic research programs. The bill supports outstanding young researchers through grants at the NSF and the Department of Energy, while also establishing a national coordination office to identify, prioritize and fund research infrastructure at universities and national laboratories.

If you have any questions about these or any other issue, please do not hesitate to contact my office at (916) 498-5600.

Sincerely,

[Signature]

DORIS O. MATSUI  
Member of Congress

DOM:nd
April 24, 2007

Ursula Bechert, DVM, PhD
Director of Off-Campus Programs
College of Science
Oregon State University
DBPP- 2082 Cordley Hall
Corvallis, OR 97331

Dear Dr. Bechert:

I am writing in support of the development of a Graduate Certificate in Management for Science Professionals at OSU. I understand that this certificate program would be designed for science majors and emphasize organizational finance, marketing and entrepreneurship, communications, ethics and professional skills. My work with the Council on Competitiveness has made me keenly aware of the need for this type of training. The Council on Competitiveness is a private nonprofit organization comprised of CEOs, university presidents and labor leaders focused on fostering innovation-based growth and global competitiveness. As part of our National Innovation Initiative, the Council recommended the development and support of these types of PSM programs. We believe PSM programs and this type of training are essential for national competitiveness and regional economic growth as well. In my collaboration with the Council on Graduate Schools in support of PSM programs throughout the nation, I have seen a large demand for graduate certificate programs in communication, ethics and business skills, not only within the PSM programs, but by students in many different fields of science who are preparing for a research career and pursuing a Ph.D.

During my many years working at the National Science Foundation as the Director of Science and Engineering Indicators, I became convinced that providing business and communication skills for scientists and engineers is an important way of capturing and transmitting innovative ideas and products. Additionally, my colleagues at the National Science Foundation and other federal and state technical agencies needed and used such skills in our work responsibilities as science administrators on a daily basis. These skill sets are very important not only for entrepreneurs and business professionals, but also for scientists and engineers in all occupations, because they need to be prepared to enter the workforce in many different sectors.

1500 K Street, N.W., Suite 850, Washington, D.C. 20005 (202) 882-4292 Fax (202) 682-5180 compete.org
I was very impressed with the OSU PSM programs and students when I recently participated in the two-day OSU industry advisory meeting for your PSM programs. I believe that instituting a "Graduate Certificate in Management for Science Professionals" would strengthen the PSM programs and also meet a broader need at OSU and the Corvallis community. Indeed, I believe that the curriculum would be of broader interest throughout Oregon and the nation.

Good luck in your efforts to formalize such a graduate certificate program. I believe that it will be a big success.

Sincerely,

Jennifer Sue Bond
Senior Advisor
Council on Competitiveness
April 24, 2007

Ms. Ursula Bechert, DVM, PhD
Director of Off-Campus Programs
College of Science
Oregon State University
DBPP- 2082 Cordley Hall
Corvallis, OR 97331

Dear Dr. Bechert:

I was very pleased to see the proposal for Graduate Certificate program for Science Professionals in Management.

As you know, AOI is Oregon’s largest and oldest comprehensive business association, with members ranging from Intel to single-person small businesses. Many of our members are research and consulting companies, especially high-tech and environmental.

Our members often seek managers, or those with management potential, with master’s degrees in science, engineering and mathematics. Unfortunately, most employees with scientific background have little or no managerial training, a very real deficit. So the proposed curriculum looks very germane to today’s business needs.

I believe graduates from such a program, who must now compete with applicants throughout the nation or worldwide, would be very attractive to Oregon employers.

Please feel free to cite AOI as a strong endorser of your proposal.

Sincerely,

John Ledger
Vice President, External Affairs

JL:kah
April 20th, 2007

Dr. Ursula Bechert  
College of Science  
Oregon State University  
2082 Cordley Hall  
Corvallis OR 97331

Dear Dr. Bechert:

I have been a long-time, enthusiastic supporter of the Professional Science Master’s (PSM) Program at Oregon State University (OSU), because I understand the value of merging training in business management, communications, ethics and professional technical skills with a science-based graduate degree. At Chemica Technologies, Inc., we value scientists who understand how their work fits within the broader context of the world of business. These individuals are more effective contributors to team projects and are versatile employees.

Oregon State University’s Graduate Certificate Program in Management for Science Professionals will broaden access to this type of training to non-PSM degree-seeking individuals, which is excellent. Additionally, I understand that other universities offering PSM degrees are interested in curriculum sharing opportunities, and OSU’s Graduate Certificate Program in Management for Science Professionals would certainly be of interest as an online option.

The Graduate Certificate Program will enable individuals to bridge the gap between business and science in a variety of workplaces, and I really appreciate your devoted effort to further develop and promote this substantial program to fill a long time need in many industries.

I strongly support the PSM program at OSU.

Sincerely,

[Signature]

Dr. Takuji Tsukamoto  
President/CSO  
Chemica Technologies, Inc.  
325 SW Cyber Dr.  
Bend, OR 97702-1076
To: Ursula Bechet, DVM, PhD

Dr. Becher,

I was excited to learn of your proposal to create a Graduate Certificate Program from the PSM cohort curriculum that is designed specifically for science majors not included in the PSM program. I am also very supportive of your proposal to develop an online version of this certificate program as I believe this would be an attractive learning option for many students, especially adult learners who are returning for higher level academic degrees.

As you are aware, I am a big proponent of students in science or science-related fields receiving some type of formal training in management, communications, ethics and professional technical skills.

Employers, such as Hewlett Packard, appreciate technical candidates who have a basic understanding of finance and marketing principles, have been exposed to the potential business practices companies might use when managing in an innovative environment, have a grounding in business ethics and know multiple methods for communication. Applicants with this type of background are typically more successful in the interviewing process than those who do not.

I would like to provide my support for your proposal as I believe programs such as this are in the best interest for companies such as ours — now and into the future. Please let me know if there is anything more I can do to help in gaining the approval you need to move forward on this.

Regards,

Linda Amedo

---

Linda Amedo
Business Systems Manager-
Graphics and Imaging Business
Hewlett-Packard Company

541-715-3552 Phone
541-715-9929 Fax
linda.amedo@hp.com
April 23, 2007

Dr. Ursula Bechert  
Director of Off-Campus Programs, College of Science  
Oregon State University  
Corvallis, OR 97331

Dear Ursula:

I am happy to hear about the new proposal for a Graduate Certificate in Management for Science Professionals. Since it will require courses that are already in place for the Professional Science Master degree program, it should require minimal extra effort for a possibly significant reward to OSU.

The courses required to earn the certificate would be very valuable for a scientist in virtually any business situation. Even scientists intending to pursue academic careers could profit considerably if ever they should become involved with a spin-off or other cooperative venture with a small company.

I approve this initiative wholeheartedly.

John Gardner  
President, ViewPlus Technologies and  
Professor Emeritus, Physics, Oregon State University
April 24, 2007

Ursula Bechert, DVM, PhD
Director of Off-Campus Programs
College of Science
Oregon State University
DBPP- 2082 Cordley Hall
Corvallis, OR 97331

Re: Letter of support for Graduate Certificate Program

Dear Dr. Bechert,

Per your request I would like to express support from the Oregon Department of Fish and Wildlife (ODFW) for your proposal to create a Graduate Certificate in Management for Science Professionals.

ODFW employs over 1,000 managers, biologists and administrative support staff. Most of our biologists receive their formal education in one of the life sciences such as fishery or wildlife biology. On the job training for ODFW biologists focuses on collecting and interpreting data from a suite of fish or wildlife species. Most ODFW managers are recruited from within the rank of our biological staff and have little formal training to manage human and financial resources. There are several reasons why the Graduate Certificate in Management for Science Professionals is appealing. First, the list of courses you provided is consistent with management skills necessary to become an effective manager. Second, the courses are offered throughout the year and the program can be completed in eight months. Finally, since many ODFW employees live in remote portions of the state, an on line, distance learning option is highly desirable.

Good luck developing the program and feel free to contact me should you have any questions.

Sincerely,

Charlie Corrarino
Conservation and Recovery Program Manager
Cc:
Virgil Moore, ODFW Director
Dr. Dan Edge, Head, OSU Department Fisheries and Wildlife
Laurie Byerly, ODFW Deputy Director
Roxie Burns, ODFW HR Administrator
Ed Bowles, ODFW Fish Division Administrator
Ron Anglin, ODFW Wildlife Division Administrator
Appendix D: NGA Proposal and Letters of Support and Approval
State Strategies to Meet Emerging Workforce Needs through the Professional Science Masters Program

OREGON’S CHALLENGE

According to business leader participants in a recent survey by Monitor, Oregon is a great place to live but lacks a sufficient skilled labor pool, most particularly lacking in specialists in engineering and the sciences. The same survey found that responding companies in Oregon interact with the state’s universities at twice the rate of others in the United States and globally, indicating a strong level of collaboration and partnership. The Monitor analysis further urged the state to position itself by:

- Creating jobs to provide opportunity for the state’s rapid population growth (Oregon: 7.9% compared to the U.S.: 6.1%);
- Raising average wages (Oregon: $37,711 compared to the U.S.: $42,405) by focusing on maintaining innovation levels (Oregon: 17.91 patents/10,000 workers versus the U.S.: 8.96 patents/10,000 workers);
- Expanding high-end manufacturing (e.g., IT products, analytical instruments, heavy machinery and machine tools); and
- Fostering non-urban development by maintaining the state’s strong positions in agriculture-related clusters (e.g., wine, forest products, and furniture).

Two of the primary strategies that were recommended for the state to differentiate itself were: (1) to improve education from prekindergarten through university levels, with particular emphasis on higher education, and (2) to increase support of entrepreneurship to bolster home-grown industries.

The just released workforce demand projections from the Oregon Employment Department show a growing need for advanced education in many occupational groups. The table below summarizes the science, technology, engineering, and mathematics (STEM) occupation projections where the positions will be filled with an applicant that at a minimum must have a bachelor’s degree, but where the competitive candidate will have a master’s degree.

### STEM Employment Trends

#### For Occupations with Master’s Degree Hiring Preference

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<td>Computer Specialists</td>
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<td>1,475</td>
<td>180</td>
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<tr>
<td>Mathematical Science</td>
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</table>

Source: Oregon Employment Department Workforce and Economic Research (January 2008) and Oregon University System 2006 Fact Book

This table highlights the workforce impact that the retirement of highly educated baby boomers will have on the demand for critical occupations in the coming decade. Current trend data for Oregon and the
United States raises further concerns because the overall educational attainment between young and older adults finds that the higher education levels are held by the older age group. This trend does not bode well for future economic vitality.

The Governor’s Office, the State Board of Higher Education, the State Board of Education, and the Workforce Investment Board presently have several initiatives underway to expand and improve the state’s education delivery system overall and specific STEM educational/research opportunities available to Oregonians. These include:

**Unified Educational Enterprise (UEE) Subcommittee of the Joint Boards:** One of the fundamental responsibilities of this group is to respond to the Legislature’s call for postsecondary education sectors to cooperate on alignment initiatives. The UEE is on track to analyze the current enterprise alignment and identify gaps within it.

**Key Elements of an Aligned Education Enterprise:**
- Advance a standards-based education system based on agreed upon common core proficiencies with rigorous standards and learning outcomes for all students PreK-20;
- Develop clearly defined and articulated pathways that allow all students of all ages to smoothly enter and exit the education enterprise and make informed decisions regarding education and training options and opportunities;
- Facilitate development of clear, consistent, frequent, and cross-sector communication that informs students of their options and opportunities (communication includes parents, teachers, counselors, teachers, faculty, administrators, Boards, and other stakeholders);
- Study and advise on integrated data systems that allow for transfer of student records including learning and achievement across systems and institutions; and
- Make recommendations for achieving a coherent PK-20 system, with a unified vision, common language, clear agreements, up-to-date policies, and well engineered structures.

**Post-secondary Quality Education Commission (PSQEC):** The Governor has established the Commission to build a model for understanding the needs of the full post-secondary education system.

The commission is to:
- Identify the key issues to address in completing a model that identifies the particular needs of community college and university students;
- Determine the key values encompassing the mission of post-secondary education in Oregon, including access to education, educational quality, student success, professional compensation, research, service, innovation, technical/career and adult basic education;
- Solicit input from educators, education policy experts and others about the elements of the model; and from the public, input regarding educational priorities in the model;
- Develop the model based on research, data, public input and experience; and
- Communicate with stakeholders regarding model development.

**Engineering & Technology Industry Council (ETIC):** This council was established in 1997 to plan and oversee improvements in engineering programs with a focus on better serving industry's needs. This marked the first time that the state universities and the private sector worked in full collaboration to co-fund and direct efforts to grow the capacity and excellence of Oregon’s engineering and technology programs and the number of skilled workers produced through these efforts. The voting members of ETIC are industry executives who meet regularly with leaders from Oregon public university campuses to develop strategic plans and associated implementation plans. The industry members serve a fiduciary role by holding the campuses accountable for producing results based on an objective set of metrics.
ETIC investments have grown a cadre of engineers and technology workers for all of Oregon's industries, from high tech to agriculture, from tourism to forestry, and other key sectors of our economy such as energy, medical, transportation, manufacturing, and financial services. ETIC investments have been leveraged by private dollars, providing two dollars in private support in funding, equipment, scholarships and other support for every dollar of public investment. ETIC investments have established a solid base that will enable Oregon to meet its goals of more than doubling the number of engineering degrees and increasing externally funded research more than five-fold by 2020.

The Oregon Innovation Council (Oregon InC): Created in 2005 by the Governor to make recommendations on how the public sector can stimulate Oregon's economy, Oregon InC was recently awarded $28.2 million by the 2007 Oregon Legislature to implement four industry initiatives and three signature research centers. Manufacturing, food processing, seafood, and the nascent wave energy industry represent the industry initiatives. The research initiatives include ongoing support for the state's first successful signature research center, the Oregon Nanoscience and Microtechnologies Institute (ONAMI), as well as the formation of two additional signature research centers: the Bio-Economy and Sustainable Technologies (BEST) Center, which will focus on bio-products, bio-fuels and green development; and the Oregon Translational Research and Drug Development Institute (OTRADI), which will focus on infectious disease research.

This package is designed to build on Oregon's competitive advantages, enhance diverse industries, and create competitive jobs and opportunity in every corner of the state. Further, it is the product of an unprecedented partnership between the business community, state government, the venture capital community and higher education.

The Oregon Business Plan: In 2002, government, business, and academic leaders came together to form the Oregon Business Plan initiative: a comprehensive plan to grow the economy of the state through the identification of key issues that are relevant to growing business in Oregon. Updated yearly and supported by the Oregon Business Council (a private non-profit organization consisting of 47 chief executives from some of Oregon's largest businesses), the Oregon Business Plan is a model for broad inclusiveness and has a remarkable history of success in the state legislature, in economic impacts and in job creation. Cluster methodology is the strategic underpinning of the Oregon Business Plan, and since 2002, a large network of clusters has developed to feed the Oregon Business Plan and to help train industry and economic development professionals to use the tools and strategies of cluster development.

Governor's Employer Workforce Training Fund (EWTF): The EWTF was created in 2003 when the Governor directed that a portion of Workforce Investment Act funds go to support incumbent worker training with an emphasis on industry clusters. Regional Workforce Response Teams (made up of workforce and economic development practitioners) are encouraged to utilize their local EWTF resources to support the workforce needs of local industry cluster groups while the state portion of the EWTF resources has been used to support statewide industry sectors (like healthcare and manufacturing) and assist in training the local practitioners in the regions on how to use the cluster-oriented approach. In addition, the fifteen workforce regions each received additional funds from EWTF to expand their capacity to use the cluster approach to respond to cluster-based workforce needs. EWTF investments total approximately $20 million over the past four years.

Oregon's 2007 Legislative Session approved an unprecedented 18% increase in education funding for Pre-K, K-12, Community Colleges, and Oregon Universities, plus targeted investments in high-demand occupational programs in healthcare and engineering. These resources will support the education and training needs of businesses along with the Oregon InC investments.
GOALS & EXPECTED OUTCOMES FOR THE PSM POLICY ACADEMY PROCESS

In *Priming the Talent Pipeline: Oregon's Future Workforce Needs Analysis*, commissioned by the Oregon Workforce Investment Board as its strategic plan, a number of key strategies are identified to: (1) place greater emphasis on lifelong learning over the course of an individual's career, (2) increase levels of entrepreneurism, and (3) put greater emphasis on technical professionals developing hybrid skill sets. These broader skill sets include knowledge about supply chain management, quality and process control, data and decision support tools, customer service, company/market needs, and global commercial awareness. Offshore outsourcing is raising skill requirements for innovation, new product design and project management.

There are currently four PSM programs at Oregon State University (OSU) in Applied Biotechnology, Applied Physics, Environmental Sciences, and Applied Systematics in Botany that were initiated with a $400,000 grant from the Alfred P. Sloan Foundation in 2002. Program development was based on feedback from local industry and follows the precedent set by ETIC for industry involvement by engaging an Advisory Board and organizing annual workshops. The last workshop, held at OSU in late November 2007, explored how new PSM programs at OSU could positively impact workforce development needs. Allen Alley, the Deputy Chief of Staff for Governor Kulongoski, was the keynote speaker. Potential programs in several STEM disciplines were recommended and paralleled the needs summarized in the employment trends table on page one.

Currently, these are the only PSM programs in the Pacific Northwest. Expansion of PSM programs will give Oregonians a new advanced education choice that will keep them competitive in the rapidly changing workforce. Importantly, PSM graduates prefer to remain in the state with approximately 68% of OSU's cohorts staying in Oregon and 77% in the Pacific Northwest. Similar trends have been noted elsewhere (e.g., 55% of Penn State University's PSM graduates remain in the state). These programs also appeal to minorities and women; approximately 50% of PSM enrollment at OSU is comprised of women.

Our goals in participating in the PSM Policy Academy Process are to learn how other states have implemented system-wide, economically viable PSM programs and to initially identify and prioritize development of specific PSM programs in Oregon to address future workforce needs. We plan to create task forces using experts from the Oregon Employment Department, UEE, ETIC, Oregon InC, and Oregon Business Plan initiative representatives, and members of the OSU PSM Advisory Board as well as the NGA Policy Academy home team. These groups will gather information from representative industries and then work together to publish a report of these findings.

An action plan for development of new PSM programs in the state will draw from the collective knowledge and resources of Oregon's initiatives described earlier, the Oregon University System, and PSM program experience at OSU. The professional curriculum offered at OSU for its PSM programs represents several years of development involving input from industry as well as other universities. Students take a series of eight courses, which include a year of business training (accounting and finance; project management and marketing; innovation management), courses in communications, research ethics, and a series of professional skills seminars. These courses will be available in an online format in the fall of 2009 and could augment PSM program development at institutions across the state. Various partnerships will encourage development of economically viable programs (e.g., joint degree programs between academic institutions). By working together with groups like the UEE, a pipeline to produce future PSM graduates can be created.

A PSM start-up grant fund will then be established, with co-funding from representative industries, to support development of new programs at Oregon's academic institutions. Nationally, PSM programs in the biosciences predominate, representing over a third of the PSM degrees granted in 2006 (Council of
Graduate Schools, February 2008). Oregon InC’s initiatives and research centers reflect this growing area of interest, and could help spearhead cooperative partnerships with industry to further development of PSM programs in the state. It is also anticipated that Congress will include appropriations for PSM programs at the National Science Foundation (NSF) in legislation for 2009. This forward momentum will be beneficial to Oregon institutions seeking support for program development from NSF in the future.

Oregon businesses are dominated by many medium and small firms that will need to hire professionals with broad skill sets envisioned by PSM programs. The PSM movement has the potential to not only produce graduates capable of bridging the gap in communication between the research and marketing arms of industry, but between industry and academic institutions as well. The PSM alumni from OSU have shown a strong interest in networking among other PSM cohorts, maintaining ties to OSU, as well as promoting the PSM at their place of employment. The opportunity to further develop PSM programs in Oregon at this time are perfect, given the work that has already been done and the initiatives to expand and improve the state’s education delivery system that are currently underway.

PROPOSED TEAM COMPOSITION

The core team is comprised of highly effective and skilled individuals with knowledge and authority to get things done. (Contact details are included in the Appendix.)

Bruce Schafer, Team Lead: Bruce is the Director of Industry Affairs for the Chancellor’s Office of the Oregon University System and the Executive Director of the Engineering & Technology Industry Council. Prior to joining the Oregon University System in 1999, Bruce was the President and founder of PC-Kwik Corporation, which was licensed to major personal computer manufacturers. Prior to founding PC-Kwik, Bruce served as an engineering and marketing manager at Intel Corporation. Bruce will be working with provosts and deans from colleges across the Oregon University System to identify programs with the strongest support from employers, students, and schools that would be best candidates for the PSM program.

Senator Richard Devlin, Senate Majority Leader: Senator Devlin is serving as chair of the Senate Committee on Rules and Executive Appointments and is also a member of the Senate Committee on Commerce and Labor. Senator Devlin has extensive experience with budget and education issues, having served on the Joint Ways and Means Committee for several legislative sessions. Senator Devlin will help guide the PSM initiative through the cross-sector legislative priority-setting process blending this critical need between graduate education and economic development.

Margie Lowe, Governor’s Higher Education Policy Advisor: With over two decades experience in management of budget and policy issues in multiple programs areas, Margie has spent the past four years focused on implementing strategies to make postsecondary education more affordable and successful for all Oregonians. She has effectively worked with agency officials, stakeholder groups, and legislators to implement innovative programs in education and human services. Margie will be working with executive branch agencies for employment, economic development, workforce development, and higher education to assure full support from critical stakeholders.

Steve Mahon, General Manager for TriQuint Semiconductor: Steve has 26 years experience in the semiconductor industry specializing in GaAs and integrated circuit processing and microwave acoustics. Currently, Steve oversees design, development and manufacturing of bulk acoustic wave (BAW) microwave filters. He holds bachelor’s and master’s degrees in electrical engineering. Steve’s role with TriQuint Semiconductor and its affiliation with the University of Oregon’s Material Science Institute’s graduate internship program causes him to be particularly interested in improving Oregon’s ability to produce graduates with degrees that combine science, business, and communication.
Ursula Bechet, Director of Off-Campus Programs, College of Science: Since January 1998, Ursula has been working at OSU to develop research and educational programs in the sciences. She has been leading development of the PSM programs at OSU since 2002, and is currently the Vice President of the National PSM Association (NPSMA). Ursula chairs the NPSMA’s Strategic Planning Committee and serves on its Board Development and Best Practices committees. She has a degree in veterinary medicine and a PhD in reproductive endocrinology, and as an OSU faculty member, understands what is involved in conducting research, teaching, and building educational programs from the ground up. Ursula will be working with home team members and industry representatives to gather information about potential Oregon PSM program needs, and will also help to initiate and mentor new PSM programs at other institutions in the state.

Home-team members will work with and support the efforts of the core team. All of the individuals listed have been serving in an advisory capacity guiding growth and development of OSU’s PSM programs.

Linda Amedo, Manager of Business Systems and Industrial Engineering, Hewlett Packard: Linda has been with Hewlett Packard since 1978, and is currently managing a team responsible for providing systemic improvements in business performance through the use of their business process and modeling expertise and analytical and project management capabilities. She also serves on the Advisory Boards for the College of Engineering and the PSM Program at OSU.

Charlie Corrarino, Conservation and Recovery Program Manager, Oregon Department of Fish and Wildlife: Charlie is responsible for oversight of native fish conservation issues and implementation of Oregon’s Native Fish Conservation Policy, and he collaborates with the OSU Department of Fisheries and Wildlife on the operation of the Oregon Hatchery Research Center.

Bob Lanier, Executive Director, Oregon Biosciences Association: Bob serves as the President of MouldWorks, which is based at the University of Oregon. He has served in a variety of entrepreneurial positions in the past, including Director of Business Development for Partner LABfx, Director of Sales and Marketing for Neo-Genesis, and Co-Founder/Director of International Sales for Antalys, an AI oriented software consulting company, which was acquired by Baan Enterprise Systems in 1997.

John Ledger, Vice President for External Affairs at Associated Oregon Industries: Associated Oregon Industries (AOI) is Oregon’s largest business organization. John is the editor of the Business ViewPoint magazine, oversees all public and other external relations for AOI, and lobbies the Oregon legislature on environmental and transportation issues. He originated and authored the legislation creating the Oregon Sustainability Board, the first of its type in the nation.

Hans Neukomm, retired Vice President and Director of the Energy Services Division, CH2M Hill: In 1998, Hans was appointed to the Oregon Energy Facility Siting Council and in 2005-06, he served as the Council’s Chair. Hans is very active in community service for which he received the State of Oregon’s Economic and Community Development Award for Outstanding Community Leadership in 2002. He serves on the Board of the Good Samaritan Hospital and the Linn-Benton Community College Foundations, on the OSU PSM Advisory Board, and is a Past Chairman of the Corvallis-Benton County Economic Development Partnership.

This team of industry experts will be augmented with appropriate executive branch partners as planning needs evolve. This will include participants from the Oregon University System, the Employment Department, Economic and Community Development Department, and the Community Colleges and Workforce Development Department.
APPENDIX – PSM CORE TEAM ROSTER

Bruce Schafer, Team Lead
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Beaverton, OR 97006-2920
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FAX (503) 725-2921
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Phone (503) 986-1719
FAX (541) 986-1080
District:
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Tualatin, OR 97062
Phone (503) 691-2026
E-Mail: sen.richarddevlin@state.or.us

Margie Lowe, Higher Education Policy Advisor
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FAX (503) 378-3225
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Steve Mahon, General Manager
TriQuint Semiconductor
63140 Britta St. Building C
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Ursula Bechert, Director of Off-Campus Programs
College of Science
Oregon State University
2082 Cordley Hall
Corvallis, OR 97331-2902
Phone (541) 737-5259
FAX (541) 737-3573
E-Mail: ursula.bechert@oregonstate.edu
March 3, 2008

Chris Hayter  
National Governor's Association, Hall of the States  
444 North Capitol Street, Suite 267  
Washington, DC 20001-1512  

Dear Mr. Hayter:

The prospect of being one of the states chosen for inclusion in NGA's Policy Academy on State Strategies to Meet Emerging Workforce Needs through the Professional Science Masters Program is an exciting opportunity for Oregon's higher education system. Oregon's efforts to expand and improve the state's education delivery system and specifically our (STEM) educational/research opportunities including the four Professional Science Masters (PSM) programs at Oregon State University (OSU), positions us well for the opportunities of this particular Policy Academy.

Our state's innovative approach to the implementation of cluster-based economic development is complemented by several education-focused initiatives described in the proposal. Employment needs for master's level STEM occupations are expected to increase significantly over the next decade, particularly in the computer, mathematical and physical sciences. Expanding the number of PSM degree options available in Oregon will help us fill these workforce needs by providing industries with scientifically trained managers. Individuals with a PSM degree complete their studies with both expanded skills in their science discipline and new professional skills in business management, communications and ethics; they also will have gained practical experience through internships making them ideally suited for key emerging industry positions. And master's graduates are more likely to remain in the state than those earning other types of graduate degrees.

This NGA Policy Academy will help us explore specific Oregon PSM program needs and promote development of these new programs in cooperation with industries destined to hire the PSM graduates. Bruce Schafer, Director of Industry Affairs for the Oregon University System Chancellor's Office, is in a key position to direct implementation of statewide adoption of PSM programs and is enthusiastic about serving as the leader of the core team. Oregon State University presently has the only PSM programs in the Pacific Northwest; their Director, Ursula Bechert, is eager to expand PSM programs throughout the Oregon University System.
I have selected three partners to serve with Bruce and Ursula on Oregon’s core team; they are committed to rolling up their sleeves and spending a significant amount of time on this project, including, but not limited to, participation in these activities:
- Advance preparation with the team prior to the Policy Academy;
- Attendance at the two-day Policy Academy Workshop held June 2 and 3, 2008 in Sacramento CA;
- Implementation of the plan, including creation of a PSM start-up fund for academic institutions; and
- A one-day site visit from NGA project staff in the fall of 2008 to review progress of the plan.

The adoption of statewide PSM programs will raise awareness of these innovative programs and help Oregon respond to critical workforce needs. I understand that the work done in the Policy Academy will, ultimately, have far reaching effects, so I am fully committed to providing the support necessary to sustaining the gains realized through this process. Thank you for your consideration of this proposal; I look forward to Oregon’s selection.

Sincerely,

[Signature]

THEODORE R. KULONGOSKI
Governor

TRK:ml:cy
March 27, 2008

The Honorable Theodore R. Kulongoski
Governor
State of Oregon
900 Court Street NE, Room 254
Salem, OR 97301-4047

Dear Governor Kulongoski:

I am pleased to inform you that Oregon has been selected to participate in the NGA Center for Best Practices Policy Academy: State Strategies to Meet Emerging Workforce Needs Through the Professional Science Masters Program. Your state’s proposal demonstrated a clear vision, relevance to other ongoing activities in your state, and a strong commitment to action. Four other states were selected to participate.

As part of the Academy, your state team will receive an orientation conference call, participate in a national Policy Academy meeting, and receive an in-state follow-up meeting to develop and refine a state action plan. In addition, Center staff and Academy faculty will be available throughout the nine-month process. The NGA Center will cover the costs of transportation and lodging for up to five individuals per state for participation in the PSM Academy meeting. Your state may send up to one additional team members at your own expense.

This Policy Academy will begin in April 2008 and continue through December 2008. A national Policy Academy meeting will be held June 2-3 in Sacramento, CA followed up by in-state site visits this fall.

We will be in contact with your designated team leader, Bruce Schafer, to coordinate next steps in the coming weeks. In the meantime, please contact Chris Hayter of the NGA Center at 202-624-7833 or chayter@nga.org if you have any questions.

We look forward to working with your state team on this important project.

Sincerely,

John Thomasian
Director, NGA Center for Best Practices
Appendix E: Budget

Category I Proposal Budget Outline
Estimated Costs and Sources of Funds for the Proposed Program

Institution: Oregon State University

Category I Proposal Name: Graduate Certificate in Management for Science Professionals

Academic Year: 2007-2008
Operating Year: 2008-2010

Completed by: S. H. Bloomer

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* See current OPE tables at http://oregonstate.edu/dept/budgets/budgettabs/tables.htm

Faculty support is for 0.5 instructor for management courses, partial FTE for communications and philosophy courses; the management courses will grow once online and will move from the 0.5 FTE position to 1.0 FTE by the 3rd year (see below).
Support FTE is Ursula Bechert, some course delivery and program management.
Service and supplies is office, phone, incidental funds.
Other is costs of Annual Partners Conference and meetings and some recruitment activity.

Note a number of these costs have been in part defrayed by private funds from the OSU Foundation.
**Category I Proposal Budget Outline**

*Estimated Costs and Sources of Funds for the Proposed Program*

Total new resources required to handle the increased workload. If any, if the new resources are required, the budgetary impact should be reported as zero.

See "Budget Outline Instructions" on the OUS Forms and Guidelines Web site: www.ous.edu/academic-forms.html

**Institution:** Oregon State University

**Category I Proposal Name:** Graduate Certificate in Management for Science Professionals

**Academic Year:** 2007-2008

**Operating Year:** 2011-2012

(Indicate 1st, 2nd, 3rd, or 4th year—prepare one page for each)

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*See current OPE tables at http://oregonstate.edu/dept/budgets/budgetand/tables.htm*
Appendix F: Instructor CVs
CURRICULUM VITAE

URSULA BECHERT

Oregon State University
2082 Cordley Hall
Corvallis OR 97331

Phone: 541 737 5259
Fax: 541 737 3573
E-mail: ursula.bechert@oregonstate.edu

PROFESSIONAL PREPARATION

Ph.D. in Animal Sciences 1998 Oregon State University
D.V.M. - Veterinary Medicine 1991 Washington and Oregon State Universities
B.S. in Bioveterinary Science 1985 Utah State University

Journey into Leadership Training 2003 W.K. Kellogg Critical Issues Program
Immobilization of Wildlife 1999 Safe Capture International

POSITIONS

2004- Director of Off-Campus Programs, College of Science, Oregon State University (OSU)
2002-2004 Program Coordinator, Professional Science Master's, College of Science, OSU
1998-2002 Assistant Professor Senior Research, College of Veterinary Medicine, OSU
1992-1997 Associate Veterinarian, clinics primarily in the Willamette Valley, Oregon

SYNERGISTIC ACTIVITIES

Current:

- Oversee development and management of graduate programs with major off-campus components:
  - Professional Science Master's (PSM) Programs (http://professionalmasters.science.orst.edu)
    initiated with a $400,000 grant from the Alfred P. Sloan Foundation; involved faculty from five
    major colleges on campus as well as numerous industry and agency representatives to guide
    development of curricula.
  - International research and exchange programs for faculty and students in the College of Science.
- Founded and serve as Executive Director of NW Wildlife Conservation, Inc. (since 1998), a non-profit
  organization created to foster regional partnerships in the Pacific Northwest for global conservation
  through research and education.
- Conduct research through a faculty appointment in the Department of Animal Sciences at OSU.
  Projects focus on reproductive biology of wildlife species (particularly elephants) and development of
  novel diagnostic and population management tools through collaborative relationships in southern
  Africa, as well as nutritional and pharmacological studies with captive wildlife species.
- Professional and community service positions:
  - Vice President of the National PSM Association since June 2007.
- Member of the Ecology, Evolutionary, Environmental, and Organismal Biology Panel for the Science Foundation of Ireland (SFI) for the past two years, and chaired the SFI Women in Science Panel in 2006.
- Representative on the OSU International Advisory Council for the College of Science for the past two years.
- Contributing member of professional organizations including the Society for Conservation Biology, the Wildlife Disease Association, and the American Association of Zoo Veterinarians (AAZV).
- Volunteer Youth Director for high school students at a local community church since 2007.
- Member of OSU’s Faculty Hearing Committee (2004-06), Graduate School Financial Aid Committee (2005), and College of Veterinary Medicine Public Relations Committee (1998-2002).

Previous:
- Developed a Zoo and Wildlife Medicine Program for the College of Veterinary Medicine at OSU (1998-2002). Activities included:
  - Creating and advising a Student Chapter of the AAZV.
  - Mentoring students in a variety of different research projects.
  - Supervising a cooperative program with Chintimini Wildlife Rehabilitation Center and facilitating development of new preceptorship and internship programs at the Oregon Zoo and Wildlife Safari.
- Practiced as a full- or part-time veterinarian in private clinics and wildlife parks in Oregon (1992-97):
  - Examined patients, performed orthopedic and soft-tissue surgeries, handled emergencies, and developed preventive medicine programs.
  - Volunteered as a veterinarian in Kenya for one month (1994) to work with the Masai and their livestock.
- Gained business and managerial experience by working as a:
  - Marketing consultant for Bonney Enterprises, Inc. (1987) to create a landscaping business for an established corporation that provided employment to mentally handicapped adults.
  - Sales manager for Ilsa’s Konditorei & Café, Inc. (1985-86) to train personnel and generally advertise and promote the business.
  - Owner of a janitorial company that serviced residential and commercial sites on a contract basis (1982-86) while completing my undergraduate degree.

SPECIAL RECOGNITION AND SKILLS

- Offered a position as an Adjunct Scholar for the Charlie Bild VIP Program in the College of Veterinary Medicine, University of Florida (2002 and 2004)
- Invitation to join the Alpha Gamma Chapter of the Society of Phi Zeta Veterinary Honor Society (2000)
- Speak German fluently; SCUBA certified; special training in communication and counseling
## GRANT AWARDS

### Research (> $500,000 total)

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<tr>
<td>2005</td>
<td>Beavers and persistent organochlorine pollutants in estuarine and riparian ecosystems (PI)</td>
<td>$10,000</td>
<td>Oregon Sea Grant</td>
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<td>2005</td>
<td>Formulations of a long-lasting, single-does contraceptive vaccine in captive African elephants (PI)</td>
<td>$12,000</td>
<td>International Elephant Foundation &amp; Elephant Care International</td>
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<td>2005</td>
<td>Maintenance of a forest ecosystem in Northern Siberut through development of sustainable conservation-based economies (Co-PI)</td>
<td>$120,000</td>
<td>Critical Ecosystem Partnership Fund</td>
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<td>2004</td>
<td>Biology and conservation of the Mentawai Island primates in the Peleonan Forest, Northern Siberut, Indonesia (Co-PI)</td>
<td>$25,000</td>
<td>Margot Marsh Biodiversity Foundation</td>
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<td>2003</td>
<td>Ecology, population structure and movements of elephant populations in northern Botswana (Co-PI)</td>
<td>$89,944</td>
<td>USFWS</td>
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<td>2002</td>
<td>U.S.-Botswana planning visit for wetlands management &amp; hippo research workshop (PI)</td>
<td>$7,073</td>
<td>NSF and Conservation International</td>
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<td>2002</td>
<td>Pharmacokinetics and clinical efficacy of terbinafine against Aspergillosis in avian species (PI)</td>
<td>$29,868</td>
<td>Morris Animal Foundation</td>
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<td>2001-02</td>
<td>Veterinary student projects in physiology &amp; nutrition involving elephants, hippos, and pygmy rabbits (PI)</td>
<td>$19,415</td>
<td>Merck-Merial Animal Health Program</td>
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<td>2001</td>
<td>Monitoring environmental stress in African elephants through analysis of stress-activated proteins (PI)</td>
<td>$33,628</td>
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<td>1999-01</td>
<td>Undergraduate research training program (PI)</td>
<td>$4,795</td>
<td>OSU Research Office</td>
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<td>2000</td>
<td>Mechanism of initiation of cholesterol deposition (Co-PI)</td>
<td>$14,400</td>
<td>NW Health Foundation</td>
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<td>2000</td>
<td>Building capacity for the sustainable management of natural resources in the Okavango Delta (PI)</td>
<td>$99,911</td>
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<td>1999</td>
<td>Pharmacokinetics of ibuprofen &amp; phenylbutazone administered to African and Asian elephants (PI)</td>
<td>$30,000</td>
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### Education and Development (> $690,000)

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<td>2007</td>
<td>Development of an online Management for Science Professionals Graduate Certificate Program (PI)</td>
<td>$75,000</td>
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<td>2006-07</td>
<td>Formation of a National Professional Science Master’s Association (Co-PI)</td>
<td>$540,200</td>
<td>Alfred P. Sloan Foundation</td>
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<td>2002</td>
<td>NW Wildlife Conservation, Inc. conferences &amp; general support (PI)</td>
<td>$7,770</td>
<td>Autzen Foundation &amp; MWI Veterinary Supply</td>
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<td>1999</td>
<td>Opportunities for collaborative university partnerships in Botswana and South Africa (PI)</td>
<td>$5,000</td>
<td>OSU Office of International Research</td>
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<td>1998</td>
<td>Northwest Consortium for Wildlife Conservation Research (PI)</td>
<td>$61,200</td>
<td>M.J. Murdock Charitable Trust</td>
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SELECT INVITED LECTURE AND PRESENTATION TOPICS

2006  “Wildlife Conservation in Northern Botswana” for the OSU International Environmental Issues Seminar Series (invited speaker annually for 5 years)

2005  “Career Opportunities in Zoo and Wildlife Medicine” for the OSU Pre-Veterinary Club

2004  “Pharmacokinetics & Clinical Efficacy of Terbinafine against Aspergillosis in Avian Species” at the AAZV Conference in San Diego CA

2003  “Professional Master’s Degree Programs in the Sciences at OSU” at the Association for the Study of Higher Education Conference in Portland OR

  “Pharmacokinetics of Orally Administered Ibuprofen in Elephants” at the AAZV Conference in Minneapolis MN

  “Building Capacity for the Sustainable Management of Natural Resources in Northern Botswana” at the Higher Education Partnerships for International Development Conference in Washington D.C.

2002  “Monitoring Stress in Wild African Elephant Populations: Potential Management Implications” at the AAZV Conference in Milwaukee WI

  “Use of Ibuprofen in African & Asian Elephants” at the Cross-Species Approach to Pain and Analgesia Workshop in Warrenton VA

Chair of the 3rd Annual NW Wildlife Conservation Conference in Corvallis OR

2001  “Wildlife Conservation in Botswana” at OSU’s 2nd Annual International Education Week

  “Collaborative Research Initiatives in Northern Botswana” at the International Joint Conference, Society for Tropical Veterinary Medicine and Wildlife Disease Association in Pilanesberg National Park, South Africa

  “Nutritional Comparisons among Carcass & Commercial Diets for Captive Cheetahs” at the 2nd Annual NW Wildlife Conservation Conference in Winston OR

1999  Chair of the 1st Annual NW Wildlife Conservation Conference in Portland OR

Section Chair at the North American Conference on Elephant Foot Care and Pathology at the Oregon Zoo in Portland OR

1998  “Factors Affecting Prolactin Secretion in the African Elephant” (poster) at the Society for the Study of Reproduction Conference in College Station TX

1996  “Carfentanil Citrate as an Oral Anesthetic Agent for Brown Bears” at the AAZV Conference in Puerto Vallarta, Mexico

Guest Lectures for Courses at OSU

2001  “Wildlife Rehabilitation” (VM 738) for the College of Veterinary Medicine

1999  “Reproductive Physiology of Elephants” (VM 718) for the College of Veterinary Medicine

1997  “Zoonotic Diseases of Wildlife” (FW 499/599) for the Department of Fisheries of Wildlife

1993  “Exotic Animal Medicine” (VM 776) for the College of Veterinary Medicine

1992  “Reproductive Diseases of Domestic Livestock” (ANS 316) for the Department of Animal Sciences
NEW COURSE DEVELOPMENT & TEACHING

Professional Science Seminar Series (PSM 511, 512 and 513)
Developed and currently teach three classes that were created as part of a 19-credit Graduate Certificate Program in Management for Science Professionals (a requirement of the PSM Program at OSU) to provide formal training in business management, communications, ethics and professional skills for individuals in science-related fields. Personal teaching style emphasizes hands-on learning opportunities that complement didactic and demonstrative instruction. Students complete service learning projects, create their own multi-media portfolios, develop skills to conduct and give interviews, explore leadership styles, and enhance teamwork skills.

Wildlife Rehabilitation (VM 781-22)
Taught for 3 years as a 1-week block elective (i.e., full-time) to senior veterinary students. Daily classes were structured as morning lectures and afternoon workshops. Topics included: philosophy of wildlife rehabilitation; zoonotic diseases; orphaned wildlife; handling and immobilization of wildlife; medicine of raptors, waterfowl, and small mammals; wildlife forensics; and wildlife laws, regulations and policies.

Zoo Medicine (VM 781-23)
Taught for 3 years as a 2-week block elective to senior veterinary students. Daily classes were structured as morning lectures and afternoon workshops or fieldtrips to regional zoos, wildlife parks, and research facilities. Topics included: role of zoo veterinarians; classification of mammals; biodiversity crisis and conservation; preventive medicine; allometric scaling; handling and immobilization of zoo animals; zoonotic diseases; aquaculture medicine; dentistry; and medicine of: terrestrial carnivores, elephants, equids, rhinoceros and tapirs, artiodactylids, amphibians, marine mammals, monotremes and marsupials, primates, and exotic birds.

Free-Ranging Wildlife Medicine (VM 781-24)
Taught for 2 years as a 1-week block elective to senior veterinary students with a similar course structure emphasizing a hands-on, experiential learning style through workshops and fieldtrips. Topics included: role of the wildlife veterinarian; zoonotic diseases; wildlife law; infectious diseases of wild mammals; handling and immobilization of native wildlife; and principles of disease management.

PUBLICATIONS

Peer-Reviewed Papers


Abstracts


Papers in Progress

Bechert, U., Christensen, M., Nguyen, C., Neelkant, R., and Bendas, E. Pharmacokinetics of orally administered phenylbutazone in African and Asian elephants (Loxodonta africana and Elephas maximus).

Bechert, U., Christensen, M., McBain, J., and Wyatt, J. Pharmacokinetics of orally administered terbinafine in African penguins (Spheniscus demersus) and treatment efficacy against Aspergillosis. J. Zoo Wildl. Med.


REFERENCES

Sherm Bloomer, PhD, Dean
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E-mail: bloomers@science.oregonstate.edu

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Division of International Conservation
US Fish & Wildlife Service
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Arlington, VA 22203
Tel: 703 358 2460
E-mail: richard_ruggiero@fws.gov

John Hanks, PhD, Consultant
International Conservation Services
P.O. Box 254, Greyton 7233
South Africa
Tel: 011 27 82 779 1114
E-mail: hanksppt@iafrica.com
VITA

Gregg B. Walker, Ph.D.

(condensed vita – environmental communication, natural resource management focus)

Positions:  
Professor of Communication  
Adjunct Professor of Forest Resources  
Adjunct Professor of Oceanic and Atmospheric Sciences (Marine Resource Management)  
Adjunct Professor of Anthropology

Office Address:  
Department of Speech Communication  
Oregon State University  
Corvallis, OR 97331-6199 USA  
PH: 541.737.2461  FAX: 541.737.4443  
email: gwalker@oregonstate.edu (o), jgktwalker@comcast.net (h)

EDUCATION - Degrees Earned
Ph.D., Communication Studies, University of Kansas, 1983; M.A., Communication Studies, University of Kansas, 1982; B.S., History, Sociology, Speech Communication (three majors), University of Minnesota, 1974; B.A., Speech Communication, University of Minnesota, 1974

TEACHING AND RESEARCH AREAS
Conflict management, bargaining and negotiation processes, mediation and facilitation, environmental communication and conflict resolution, communication theory, argumentation, leadership, decision-making, collaborative governance, pluralism and participatory communication

RECENT PUBLICATIONS (partial list)

Books


Articles and Reports (monographs, book chapters)

Walker, Gregg B., and Seneca, Susan L. (accepted for publication). Communication and sustainability: Key propositions and their role implications. The International Journal of Environmental, Cultural, Economic and Social Sustainability.

Walker, Gregg B., and Daniels, Steven E. (accepted for publication). Collaborative Learning and the importance of civic space: Improving environmental policy and sustainable development decisions. The International Journal of Environmental, Cultural, Economic and Social Sustainability.


Walker, Gregg B., & Daniels, Steven E. (1997). Foundations of natural resource conflict:


**RECENT WORKSHOPS AND PROJECTS** (partial list)

**Workshops**


Senecah, Susan E., and Walker, Gregg B. (2005, September). A taste of... the Collaborative Learning approach for resolving Multi-party conflicts. Workshop presented at the Association for Conflict Resolution annual conference, Minneapolis, MN.


Department of Fish and Wildlife Managers, conducted by the Natural Resources Leadership Academy of Washington State University, Olympia, WA.


Walker, Gregg B. (2004, 10-11 May). Improving Public Participation in Environmental Conflicts: The Collaborative Learning Approach. A two-day instructional module presents as part of the graduate seminar on Environmental and Public Policy Conflict Resolution, the Program on the Analysis and Resolution of Conflict of the Maxwell School of Government and Public Service, Syracuse University, Syracuse, NY.


Projects

*Protecting Tribal Harvests: Policy Work Teams at the EPA Tribal Leaders Summit,* Confederated Tribes of the Umatilla Reservation, August 2006. Working with Kathleen Feehan, Water Quality Specialist for the Confederated Tribes of the Umatilla Reservation, I designed and directed policy work team sessions for Tribal Leaders Summit participants.

*Mixing Zone Workshop,* Salem, Oregon, March, 2006, sponsored by the Oregon Department of Environmental Quality and OSU Institute for Natural Resources. I helped design the day-long workshop of ninety participants, facilitated the workshop, and directed the afternoon’s Collaborative Learning activities. The workshop also included my presentation, “The Collaborative Learning Approach to Environmental Policy Decision-making: A Quick View.”

*Communities, Desired Conditions, and Collaborative Learning: Forest Planning under the New Rule, March 2005 – present.* Comprehensive Collaborative Learning training, assessment, community workshop, and Cooperators project conducted for the Bridger-Teton National Forest, Jackson, WY (with Steve Daniels of Utah State University).


*Improving Public Lands Management, Planning, and Decision-Making: An Introduction to Collaborative Learning,* April, May, and August 2003; September 2004, May 2005. This forest plan revision project featured comprehensive Collaborative Learning training, assessment, and community workshops conducted for the Allegheny National Forest, Warren, PA (with Sue Senecah of SUNY-ESF and Steve Daniels of Utah State University).

*The Mouth of the Columbia River Regional Sediment Management Demonstration Initiative: A Collaborative Learning Approach to Stakeholder Involvement,* September 2003-September 2004. Sponsored by the Portland and Seattle Districts of the U.S. Army Corps of Engineers, this comprehensive Collaborative Learning (CL) project that included conversations with over seventy stakeholders, CL training workshops for stakeholders and
Corps personnel, and a CL community workshop on the science and organization of RSM (with assistance from Pat Corcoran of Oregon Sea Grant, Steve Daniels of Utah State University, Corrine Gobeli of Oregon State University, and present and former graduate students).


**Collaboration, Systems Thinking, Facilitation, and Community Decision-making**, March 2002. Three day workshop presented to the University of Nevada Cooperative Extension Service, Las Vegas, NV (with Steve Daniels of Utah State University and Pat Corcoran of Oregon Sea Grant Extension).

**Improving Public Land Management: An Introduction to Collaborative Learning**, USDA Forest Service, Region 2, Fort Collins, CO, 06-07 September 2001. This was a two-day introductory training course prepared for and presented to planning staff from Colorado and Wyoming (Region 2) national forests (with Steve Daniels, Director, Western Rural Development Center, Utah State University).

**Planning, Participation, and Public Land Management: The Collaborative Learning Approach**, USDA-Forest Service, Region 9, Milwaukee, Wisconsin. Two and one-half day introductory training course about the philosophy, framework, and techniques of Collaborative Learning. The course was presented to the senior planners from the national forests of Region 9—the Midwest, Mideast, and Northeast United States (with Steve Daniels, Director of the Western Rural Development Center, Utah State University, formerly of the Department of Forest Resources, Oregon State University).

**Improving Public Land Management: The Collaborative Learning Approach**, USDA-Forest Service Eastern and Southern Regions [Regions 9 and 8] University, Cincinnati, Ohio, 29-31 January 2001. This was a three day course in the theory and practice of Collaborative Learning in public land management, decision making, public participation, and conflict resolution (with Steve Daniels).

**People, Watersheds, and River Parks: A Collaborative Learning Design and Facilitation Training**, College Station Texas, June-July 2000. This project was sponsored and hosted by the Center for Public Leadership Studies, George Bush School of Government and Public Service at Texas A & M University. Funded by the San Antonio Water System and the San Antonio River Authority, the project included two separate 2-day training programs. The first, held in June, presented an introduction to Collaborative Learning. The subsequent July training emphasized how to design and facilitate Collaborative Learning activities (with Steve Daniels).

**Collaboration and Community-Based Watershed Management: Training and Critique**, Ashton, Idaho, April 1999. This project included an assessment of the Prepared for The Henry’s Fork Watershed Council and a one-day training on facilitating multi-party collaboration, sponsored by the Henry’s Fork Foundation & the Fremont-Madison Irrigation District (with Steve Daniels).

**Public Participation, Collaborative Learning, and the South Deep Area**, Colville National Forest, Colville, WA, December 1998 through April 1999. This project included a two-day "Introduction to Collaborative Learning" training for Colville National Forest staff and Colville area community leaders. The project also featured a day-long citizen workshop on the South Deep area (with Steve Daniels, and Keith Blatner and Matthew Carroll of Washington State University).

**Public Participation, Planning, and the Chugach National Forest**, Anchorage, AK, August 1997 to 1999. This project included both introductory and basic training programs on Collaborative Learning as a basis for public participation activities and interdisciplinary team
work as part of the forest plan revision process. In addition to training, the project featured
the design and facilitation of Collaborative Learning citizen workshops, and situation
assessment interviews (with Steve Daniels).

Collaborative Learning, Citizen Involvement, and Forest Policy: A Facilitator Training,
sponsored by the Great Lakes Forestry Alliance and Wisconsin Rural Partners, Inc., 18-20
February, 1998. This project consisted of an introductory workshop, “Natural Resource
Land Use Conflict Resolution: Opportunities for Communities,” for community leaders. That
workshop was followed by “Collaborative Learning, Involved Citizens, Natural Resource
Dependent Communities, and Forest Policy,” an advanced facilitator training program
connected to the January 1997 workshop on “public participation and land use conflict
resolution.”
PROFESSIONAL PROFILE

➢ Entrepreneur, educator and businessman with broad background and diverse experience
➢ Communicator with extensive experience in cross-cultural dialog with consumers and business customers in America, Europe and Asia
➢ Researcher seeking new approaches and innovative solutions
➢ Author of over 50 published papers, international presentations and patented inventions

EDUCATION

MBA, University of Connecticut, School of Business Administration, Stamford, CT, 2000
- Concentration: Global Marketing and Management

Ph.D., State University of Geodesy and Aerial Surveying, Moscow, Russia, 1987
- Concentration: Technical Sciences
- Dissertation title: Research of the Holographic Measurement Methods

M.S., Environmental University, Odessa, Ukraine, 1976
- Concentration: Applications in Computer Sciences
- Thesis title: Data Processing System for the World Weather Data Center


GLOBAL MARKETPLACE EXPERIENCE

Worked, taught in or traveled to 30+ countries:
- 22 in Europe
- 5 in North America
- 5 in Asia

Fluent in three languages, have basic knowledge of three more.
Quickly establish cross-cultural communications leading to development of long-term business relations.
TEACHING EXPERIENCE

2007  
Adjunct Associate Professor  
Worcester State College, Worcester, MA  
- Developed a course on Global Market Forecasting and will teach on-campus and online classes for the Division of Graduate and Continued Studies at WSC  
- Use Blackboard software as a main tool to enhance student learning experience  
- Continue research of brand marketing in transitional economies. Submitted a paper discussing this subject to Academy of Marketing Science Review.

2006  
Adjunct Faculty  
Whittemore School of Business and Economics, UNH, Durham, NH  
- Taught a course of Market Opportunity Analysis to two sections of full and part-time students with business majors. Extensively used Blackboard and WebCT tools for lecturing, student project management and examination purposes  
- Complemented lectures with real-life team and individual student projects  
- Actively communicated face-to-face and electronically with colleagues and students  
- Conducted research of the management decision making based on sales analysis and forecasting in B2B and B2C markets  
- Researched consumer behavior in countries with transitional economies to develop effective strategies in brand marketing  
- Researched applications of clean energy technologies in residential housing markets and RFID marketing tools.

2005  
Invited Lecturer  
Shanghai Microelectronics Equipment Co., Shanghai, China  
- Taught Business and Technology Aspects of the Contemporary Semiconductor Manufacturing Markets to Chinese scientists and engineers (mostly Ph.D. level).

1979-1991  
Graduate Thesis Mentor, Scientific Advisor  
Polytechnic Institute, Odessa, Ukraine  
- Served as a thesis mentor (scientific advisor) and internship supervisor to graduate students in Computer Sciences. Guided graduate research, reviewed and approved Masters theses, participated in thesis defense of 12 graduate students, 11 of whom graduated with high honors.

1988-1990  
Adjunct Professor  
College of Cultural Studies, Odessa, Ukraine  
- Taught continuing education graduate and undergraduate students a course Use of Photography in Advertising.
INDUSTRY EXPERIENCE AND SELECTED ACCOMPLISHMENTS

2003-Present  Founder and Chief Strategist
BiFoS, LLC - Bi-Focal Strategies, Merrimack, NH (privately held)

Advise presidents and owners of small and mid-size client companies on business strategy.
- Analyze respective markets and uncover new opportunities in the US, UK, China and Russia
- Identify the most effective marketing and sales initiatives to achieve overall business objectives
- Proposed and implemented cross-specialty marketing approach involving several companies
- Develop new product roadmaps and help to implement derived business strategies
- Analyze cash flows to determine the product/service profit drivers
- Helped the DoD prime contractor to successfully reshape organizational strategy
- Helped to optimize the company profit margins via pricing strategy and loss-cutting techniques.

2003-2004  Manager, Member of Executive Team
Greenerd Press & Machine Company, Nashua, NH (privately held)

- Identified new market opportunities, developed the company technology roadmap to increase competitiveness and profit margins of the products - sophisticated hydraulic presses
- Spearheaded development of the new SPC-capable control system strategy to win new customers
- Met with key customers, presenting new products, negotiated specifications, helped to close sales
- Established and enhanced collaboration with Sales, Manufacturing and Purchasing departments
- Implemented pre-quote analysis of the sophisticated projects, boosted support of sales and service
- Managed development and promotion of 12 new products, including 3 unique ones
- Energized and motivated engineers, making their role in the product design and implementation pivotal to the whole organization

2002-2003  Vice President of R & D, Member of Executive Committee
Acu-Rite Companies, Jamestown, NY (subsidiary of $700 mil multinational Heidenhain GmbH)

- Developed and communicated a product roadmap to enhance the market share
- Coordinated product development activities with Sales, Marketing and Manufacturing functions
- Identified and discussed future product requirements with customers. Supported sales activities at domestic, European and Asian subsidiaries
- Conceptualized a new product targeting the Mainland China market
- Had budget - over $1 mil - and hiring authority over the Engineering organization - 23 engineers and technicians. A two-tier organization included four engineering groups, prototype and testing labs with matrix teams
- Led the development of 3 new products
- Shaped and coached a team of R&D, Quality and Manufacturing specialists redesigning the production technology to increase an important product yield from 70 to 95%, reducing the rework costs at the same time
- Collaborated with Quality department to ensure ISO 9001 compliance in design and manufacturing.
1997-2002  **Leader/Architect, Control Systems**  
*ASML-CT (formerly SVG), Wilton, CT (subsidiary of $9 bil multinational ASML)*

- Led five cross-functional and cross-disciplinary teams of 3 to 5 Ph.D. and MS-level specialists. Leveraged matrix environment to better utilize resources.
- Identified new opportunities in emerging technologies: developed the best-in-the-industry dose control systems for 5 generations of lithographic machines, implemented in 1998-2003
- Translated marketing requirements into strategic technical solutions. Developed and negotiated systems specifications and budgets
- Developed Visual Basic models describing and predicting behavior of sophisticated processes
- Delivered six presentations at international conferences and national workshops
- Presented new designs to major customers: Intel, IBM, Motorola, Samsung, etc.
- Coached engineers and technicians

1995-1996  **Electronic Publishing Production Supervisor**  
*Research Institute of America, New York, NY (subsidiary of $7 bil Thomson Holdings)*

- Hired and trained the new production team
- Played a key role in a team, launching 12 new products: supervised multiple releases
- Co-developed and implemented the TQM system and reduced annual production costs by more than $200,000.

1994-1995  **Manager of Operations**  
*Beta Business Products, Inc., New York, NY (privately held)*

- Took over the ailing division, bearing full budget and partial P&L authority
- Built new team: hired, trained and coached 25 employees
- Supported sale force, conducted customer presentations
- Re-engineered the organization and production technology to reduce costs
- Evaluated, scheduled and budgeted projects
- Developed imaging database management systems
- Outourced labor-intensive work to a Philippines partner.

1992-1994  **Sales & Marketing Director**  
*HiTech Innovative Manufacturing, Odessa, Ukraine (VC-funded startup)*

- Developed effective marketing and sales approach to advertising and promotion utilizing innovations in desktop publishing and color printing
- Had full P&L, budgetary and hiring authority
- Established strategic and tactical objectives, developed organizational structure
- Developed and implemented marketing plans, analyzed ROI, arranged proper financing.

1989-1992  **Head of Department, Member of Executive Staff**  
*Special Projects Institute for Printing Equipment, Odessa, Ukraine (nationwide corp.)*

- Developed multi-channel marketing strategy to reach out multiple end users through the partner networks
- Tripled the volume of business within two years to $10 million
- Had full P&L, budgetary (up to $3.4 mil) and hiring authority
• Served as a Principal Investigator of numerous commercial and governmental projects
• Managed large governmental programs involving 60 to 80 employees
• Extensively communicated with customers
• Developed and implemented new systems and MEMS technologies for electronic industry
• Published new research results and presented at national and international conferences.

1976-1988  **Researcher, Sr. Research Scientist**  
*Research Institute for Machine Tools and Instrumentation, Odessa, Ukraine*

• Served as a Principal Investigator of numerous commercial and governmental projects
• Conducted research in optics, lasers and holography applications for digital imaging
• Developed mathematical digital and analog models describing sophisticated processes
• Presented research results at national scientific conferences and symposia
• Developed sensors, encoders and control systems for precise machine tools and robots
• Published papers in professional journals and conference proceedings

**HONORS AND AWARDS**

• Hall of Fame Inductee - UConn School of Business
• GE Capital Fellowship for Global Marketing research and presentations
• Multiple research awards, fellowships and honorable mentions
• Silver Medal at Business and Science Show
• Bronze Medal at Business and Science Show
• M.S. degree with Highest Honors

**PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS**

Academy of Marketing Science  
UConn School of Business, Alumni & Friends Society  
SME, Southern NH Chapter  
Merrimack Valley Venture Forum  
NH Business & Industry Association  
Toastmasters International  

Fellow  
Strategy Committee Chairman  
Marketing Committee Chairman  
Program Committee Member  
Energy Committee Member  
Competent Communicator
TEACHING INTERESTS

- New product development and risk management
- Brand marketing in the countries with transitional economies
- Global marketing in technology-intensive environment
- Emerging B2B markets
- Positioning as a marketing strategy
- Market forecasting

(see more details in a separate Teaching Philosophy Statement)

RESEARCH AND PUBLICATIONS

Paper submitted and invited for a second round of reviews for a special issue ‘Cross-Cultural Issues in Marketing Research’:


Ongoing research of the consumer behavior and purchasing decision making in the countries with transitional economies. Analysis of brand marketing effectiveness and issues in customer relations management.

A full list of technical publications, including 5 in refereed journals, 12 in conference and symposia proceedings and 15 patented inventions will be furnished upon request.

FUTURE RESEARCH INTERESTS

Research interests cover several areas with either emerging technologies or the existing technologies serve as enablers of new applications.

The following topics become ever important for both domestic and international markets and shall benefit from an in-depth theoretical research:

1. Market research and forecasting of renewable energy sources (fuel cell, solar, wind, etc.) for small business and residential use
2. Real-time sales analysis and forecasting on the global marketplace using active RFID reporting.

(see more details in a separate Research Statement)
Jonathan Michael Kaplan
Curriculum Vitae

HOME: 1905 NW 14th St.
Corvallis, OR 97330
541-738-8056
email: jonathan.kaplan@oregonstate.edu
webpage: http://oregonstate.edu/~kaplanj/

OFFICE: Philosophy Department
Oregon State University
208 Hovland Hall
541-737-9802

Professional Experience and Education:

2006 - present  Associate Professor of Philosophy, Philosophy Department, Oregon State University.

2003 - 2006  Assistant Professor of Philosophy, Philosophy Department, Oregon State University.

1998 - 2003  Assistant Professor of Philosophy, Philosophy Department, University of Tennessee, Knoxville.

1997 - 1998  Lecturer, Philosophy Department, Stanford University.

1996 - 1997  Post-Doctoral Fellow with the Stanford Biomedical Ethics Center’s Program in Genomics, Ethics and Society, Stanford University.


Areas of Specialization:

Philosophy of Biology, Philosophy of Science, Political Philosophy

Areas of Competence:

Biomedical Ethics, Environmental Ethics, Philosophy of Economics, Epistemology, Metaphysics, Wittgenstein
Publications:

Books:


Peer-Reviewed Journal Articles:


Book Chapters:

(Forthcoming) "Spandrels, Pendentives, and Squinches: Architecture, Adaptation, and History." Forthcoming in Twenty Five Years of Spandrels edited by Denis Walsh. Oxford University Press.


Reviews:


Reviews, continued.


Presented Papers (Invited):


2006. “Giving up the Adaptive Landscape Metaphor.” Presented at the University of California, Irvine’s Department of Logic and Philosophy of Science Colloquium Series. May 4th, 2006.

Presented Papers (Invited), continued.


Presented Papers (Invited), continued.


Presented Papers (peer reviewed):


Presented Papers (peer reviewed) (continued):


Other Professional Activities:


Other Professional Activities (Continued).


Teaching Experience (courses taught, 1995-2006):

“Research Ethics” (a graduate seminar) OSU, 2006-present.
“(Why) Are We Rational?” (an Oregon State University Honors College colloquium) co-taught with Andrew Stivers (OSU Department of Economics) OSU, Winter 2005.
“Ethics” (an introductory course) OSU, 2004-present.
“Scientific Reasoning” (an undergraduate course) OSU, 2003-present.
“Philosophy of Biology” (both as a graduate seminar and as an advanced undergraduate course) OSU, 2003-present; University of Tennessee Knoxville (UTK), 1998-2003; Stanford University, 2002.
“Reasoning and Writing” (an introductory course) OSU, 2003-present.
“Philosophy of Science” (both as a graduate seminar and as an advanced undergraduate course) UTK, 1998-2003.
“Special Topics in Advanced Biological Practice” (an advanced graduate seminar) co-taught with Massimo Pigliucci (Dept. Evolutionary Biology, SUNY Stonybrook) UTK, 2002-2003.
“Wittgenstein: Interpretation and Method” (both as an advanced undergraduate course and as a graduate course) UTK, 2003; Stanford, 1996.
“The Philosophy of Madness: Conceptual Issues in Mental Disease” (a graduate seminar) UTK, 2002.
“The Philosophy and Science of Evolutionary Biology” (a graduate seminar) co-taught with Massimo Pigliucci. UTK, 2001.
“Topics in Contemporary Philosophy: Rorty, Davidson, and Hacking on Contingency” (an advanced graduate seminar) UTK, 1999.

Additional Teaching Interests:
“Ethical, Social and Political Issues in Agricultural Practice and Food Production”
“Biodiversity: Ethical Crises and Conceptual Difficulties”
“Political Philosophy”
Professional Service:
University/Departmental and Related:

2006 - present  Chair, Student Awards Committee, Philosophy Department, Oregon State University.
2006 - present  Member, Faculty Tenure and Promotion Review Committee for Joseph Orosco.
2005 - 2006:  Chair, Departmental Faculty Advisory Committee, Philosophy Department, Oregon State University.
2003 - 2006:  Member, Computing Resources Committee, Oregon State University.
2005:  Member, CLA Research Grant Selection Committee
2003 - 2005:  Faculty co-advisor (with Sharyn Clough), Undergraduate Philosophy Club, Oregon State University.
2003 - 2005:  Member, Departmental Faculty Advisory Committee, Philosophy Department, Oregon State University.
2000 - 2003:  Co-Chair, Colloquium Committee, Philosophy Department, University of Tennessee, Knoxville.
1998 - 2003:  Member, Head’s Advisory Committee, Philosophy Department, University of Tennessee, Knoxville.
1999 - 2003:  Member, Committee on Revising the Undergraduate Philosophy Curriculum, Philosophy Department, University of Tennessee, Knoxville.
1998 - 2003:  Member, Medical Ethics Committee, Philosophy Department, University of Tennessee, Knoxville.
2000 - 2001:  Member, Search Committee, Assistant Professor Position, Philosophy Department, University of Tennessee, Knoxville.
1999 - 2000:  Member, Head Search Committee, Philosophy Department, University of Tennessee, Knoxville.

Other Professional Service: Manuscript Reviews
2005 - present  Manuscript reviewer for *Philosophy of Science*
2004 - present  Manuscript reviewer for *The Quarterly Review of Biology*.
2004 - present  Manuscript reviewer for the *University of Chicago Press*
2003 - present  Manuscript reviewer for *Biology and Philosophy*.
2001 - present  Manuscript reviewer for *The British Journal for the Philosophy of Science*.

Professional Development:

2003  Writing Intensive Curriculum Seminar, Oregon State University.
2001  Innovative Technology Center Workshop on basic HTML, University of Tennessee.
2000  Innovative Technology Center Workshop on Blackboard System, University of Tennessee.
Fellowships Held, Grants Received, and Awards:

2007: Senior Personnel member on NSF grant application for “REU Site for Oregon Marine Science: From upper estuaries to the deep.” Principal Investigators: George W Boehlert and Robert A Duncan. Total grant amount: $300,000 over 3 years. I am responsible for the “Research Ethics Component” of the grant, which totals approximately $12,000 for three years. Awarded 2007.

2005: OSU College of Liberal Arts Research Grant ($9,102), with Andrew Valls (Department of Political Science), for our proposal “Housing Discrimination as a Basis for Black Reparations.”

2004: OSU Philosophy Department “Service Award”

2003: National Endowment for the Humanities Fellowship ($3,250), Summer Institute on Science and Values, University of Pittsburgh.

2002 - 2003: Matchette Foundation Grant ($3,000), Principal Investigator and Grant Writer

2001 - 2002: Haines-Morris Grant ($8000), Co-Principal Investigator and Grant Writer

OSU Libraries
Collection Development

Library Evaluation for Category I Proposal

Proposal to offer a Graduate Certificate in Management for Science Professionals

Title of Proposal

Departments

College of Science

The subject librarians responsible for collection development in the pertinent curricular area has assessed whether the existing library collections and services can support the proposal. Based on this review, the subject librarian concludes that present collections and services are:
[ ] inadequate to support the proposal (see budget needs below)
[ ] marginally adequate to support the proposal
[X] adequate to support the proposal

Comments and Recommendations:
Collection is currently adequate; however there is concern for the libraries ability to support growth and diversification of collection while maintaining a strong core.

Date Received: 6/22/2007 Date Completed: 7/13/2007

Laurie Bridges
Subject Librarian

Signature 7/13/07

Laurel Kristick
Head of Collection Development

Signature 7/13/07

Karyle Butcher
University Librarian

Signature 7/13/07
Oregon State University Libraries
Evaluation of the Collection Supporting:
Proposal to offer a Graduate Certificate in Management for Science Professionals

Oregon State University
College of Science
Professional Science Masters Program

This library assessment reviews the monographic and serials collections as related to the Professional Science Masters Program in the College of Science and the emphases on business, finance, communications, economics, and marketing.

We compared Oregon State University Libraries' monographic collections to those of Michigan State University, North Carolina State University, and the University of Connecticut. Michigan State University was mentioned as a peer program in the proposal and North Carolina State University and the University of Connecticut were listed on the national PSM website. In general we find that the monograph collection is adequate to support masters-level work; the lack of books in some areas, such as finance, can be filled by our consortial lending agreements with other Pacific Northwest Libraries through the Orbis Cascade Alliance.

For serials, we measured the depth of OSU collections using the ISI-Thompson Journal Citation Report (JCR) list of the top 10 titles (each) in business, finance, communications, economics, and marketing. OSU Libraries currently subscribes to forty of the top fifty journals listed for business, finance, communications, economics, and marketing listed in JCR. To measure the breadth of OSU's journal collection, we noted where core faculty for the Graduate Certificate in Management for Science Professionals have published and whether OSU Libraries subscribes to these titles.

Monographs:
We compared Oregon State University Libraries monographic collections to those of Michigan State University, North Carolina State University, and the University of Connecticut. The OSU holdings were compared against the average unique holdings from the three institutions. OSU Libraries' holdings were generally found to be adequate. Three areas were found to be lacking, finance, law, and web design, which can be supplemented through our consortial lending agreement with the Orbis Cascade Alliance. Books that are requested through the Orbis Cascade union catalog are delivered to OSU Libraries within three working days. Appendix A shows the monographic holdings in the main areas of emphasis for the Professional Science Masters program's Graduate Certificate in Management for Science Professionals at OSU as compared to Michigan State University, North Carolina State University, and the University of Connecticut.

Interlibrary Loan Activity:
Typically Interlibrary Loan (ILL) statistics are examined to gauge the need for new titles. However, because this is a new certificate that has many touch points (business, finance, economics, communications and marketing) interlibrary loan statistics will only be useful once students and faculty from the PSM certificate program begin requesting items through our ILL program. ILL statistics should be examined after the program has been established for several
years, and the collection should be adjusted accordingly.

**Government Documents:**
OSU Libraries is a federal depository for government documents. Many of the government documents that are useful for business, finance, communications, economics, and marketing are freely available online and are represented in the OSU Libraries online catalog.

**Serials/Journals:**
We compared the OSU Libraries' journal holdings against the list of ten top business, finance, communications, economics, and marketing journals listed in Thompson-ISI's *Journal Citation Report (JCR)*. The JCR assigns an “impact factor” providing a means to compare or evaluate a journal’s relative importance in the field. OSU Libraries currently subscribes to forty of the top fifty journals listed. We no longer subscribe to *Marketing Science, Entrepreneurship Theory and Practice*, and the *Review of Financial Studies*. We do not hold the *International Journal of Language and Communication Disorders, Journal of Health Communication, Health Communication, Media Psychology, Political Communication, World Bank Research Observer*, and the *Journal of Economic Geography*. It may not be important to add the *International Journal of Language and Communication Disorders*, the health communication journals, *Political Communication*, the *World Bank Research Observer*, or the *Journal of Economic Geography*, as these are not the main focus areas of the PSM department. However, it may be worth re-subscribing to *Marketing Science* ($355 for print and online combined annual subscription), *Entrepreneurship Theory and Practice* ($343 premium online annual subscription), and the *Review of Financial Studies* ($285 for online annual subscription) as these marketing and finance journals may fit within the research scope of the PSM program.

The list of journals and our holdings can be found in Appendices B-F.

**Electronic Access to Journals:**
OSU Libraries’ recent subscriptions to online journal packages, such as Springer, Wiley, and Elsevier have expanded electronic access and in most cases cover the years 1996-to the present.

**Subject-Specific Indexes and Abstracts:**
OSU Libraries subscription databases that can be useful for the Graduate Certificate in Management in Professional Science include:

- **Business Source Premier** - provides full text for nearly 3,300 scholarly business journals, including full text for more than 1000 peer-reviewed business publications including company profiles, industry profiles and market research reports. Coverage includes virtually all subject areas related to business, and includes indexing as far back as 1922.
- **LexisNexis Academic** - provides access to current business news, industry and market news, accounting literature, company financial reports and profiles, SEC filings, and legal research.
- **ComAbstracts** - indexes articles in the primary profession literature of Communications as far back as 1937.
- **Academic Source Premier** - provides full text for nearly 4,600 scholarly publications, including full text for more than 3,500 peer-reviewed journals. Coverage spans virtually every area of academic study and offers information dating as far back as 1975.
Faculty publishing:
As a measure of breadth we checked the online curriculum vitae of the core faculty listed in the Category I Proposal to see what journals they were publishing in to see if OSU Libraries subscribes to these journals. The core faculty listed are Gregg Walker, Jonathan Kaplan, and Ursula Bechert; we were unable to locate a vitae for Ursula Bechert. We identified fourteen journals in which Walker and Kaplan have been published. OSU Libraries currently subscribes to eleven of these publications, although not always with full runs of the journal. Appendix G lists these titles and OSU holdings.

Subject Librarian Support:
OSU Libraries has a Business & Economics librarian, Laurie Bridges. Laurie Bridges is the main contact for business, finance, economics, and marketing. The OSU Libraries has several science librarians, Bonnie Avery, Alison Bobal, May Chau, and Hannah Gascho Rempel, who are the main contacts for the biological sciences. The Communications librarian is Loretta Rielly.

Summary:
OSU Libraries' collections are adequate to support the Graduate Certificate in Management for Science Professionals as proposed. However, we would like to encourage the renewal of three journal subscriptions: Marketing Science, Entrepreneurship Theory and Practice, and Review of Financial Studies. The combined annual cost of these three journals is $983. We recommend that the College of Science work with the library to ensure that the collections we do have are of the highest impact, and that students and new faculty for the Graduate Certificate in Professional Science Management have access to the journals, books, working papers, and data they need to do the work of a top-ten land grant institution.

Respectfully submitted by:

Laurie Bridges
Assistant Professor and Librarian,
Oregon State University Libraries
2007
Appendix A: Monograph Holding Levels and Comparisons.

<table>
<thead>
<tr>
<th>PSM Subject Heading</th>
<th>OSU Holdings</th>
<th>Comparator School Holdings&lt;sup&gt;a&lt;/sup&gt;&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Average of Unique Comparator School Holdings</th>
<th>OSU Holdings as percent of average comparator holdings&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>1,740</td>
<td>5,787</td>
<td>1,929</td>
<td>90%</td>
</tr>
<tr>
<td>Communications</td>
<td>32</td>
<td>127</td>
<td>42</td>
<td>76%</td>
</tr>
<tr>
<td>Economics</td>
<td>3,659</td>
<td>11,021</td>
<td>3,674</td>
<td>100%</td>
</tr>
<tr>
<td>Finance</td>
<td>3,850</td>
<td>22,883</td>
<td>7,628</td>
<td>50%</td>
</tr>
<tr>
<td>Law</td>
<td>2,067</td>
<td>11,600</td>
<td>3,867</td>
<td>53%</td>
</tr>
<tr>
<td>Management</td>
<td>8,633</td>
<td>26,890</td>
<td>8,963</td>
<td>96%</td>
</tr>
<tr>
<td>Marketing</td>
<td>2,835</td>
<td>8,073</td>
<td>2,691</td>
<td>105%</td>
</tr>
<tr>
<td>Research - Moral &amp; Ethical Aspects</td>
<td>152</td>
<td>321</td>
<td>107</td>
<td>142%</td>
</tr>
<tr>
<td>Technology</td>
<td>1,926</td>
<td>4,570</td>
<td>1,523</td>
<td>126%</td>
</tr>
<tr>
<td>Web Design</td>
<td>83</td>
<td>597</td>
<td>199</td>
<td>42%</td>
</tr>
</tbody>
</table>

<sup>a</sup>The three comparator schools selected were the University of Connecticut, Michigan State University, and North Carolina State University.

<sup>b</sup>Holdings indicate a unique monographic holding from one of any of the three schools. This calculation is performed to remove overlaps between the three collections.

<sup>c</sup>A percentage higher than 100% indicates that OSU owns more unique monographs in the subject heading area than the three comparator schools.
Appendix B: Top Ten Business Journals in JCR, impact factor and OSU Libraries’ holdings.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Abbreviated Journal Title</th>
<th>ISSN</th>
<th>Impact Factor</th>
<th>OSU Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Journal of Marketing</em></td>
<td>0022-2429</td>
<td>4.831</td>
<td>v 1 (1936) - present</td>
</tr>
<tr>
<td>4</td>
<td><em>Academy of Management Journal</em></td>
<td>0001-4273</td>
<td>3.353</td>
<td>v 6 (1963) - present</td>
</tr>
<tr>
<td>5</td>
<td><em>Strategic Management Journal</em></td>
<td>0143-2095</td>
<td>2.632</td>
<td>v 1 (1980) - present</td>
</tr>
<tr>
<td>6</td>
<td><em>Administrative Science Quarterly</em></td>
<td>0001-8392</td>
<td>2.455</td>
<td>v 1 (1956) - present</td>
</tr>
<tr>
<td>7</td>
<td><em>Journal of Marketing Research</em></td>
<td>0022-2437</td>
<td>2.389</td>
<td>v 1 (1964) - present</td>
</tr>
<tr>
<td>8</td>
<td><em>Journal of International Business Studies</em></td>
<td>0047-2506</td>
<td>2.254</td>
<td>v 1 (1970) - present</td>
</tr>
<tr>
<td>10</td>
<td><em>Journal of Consumer Research</em></td>
<td>0093-5301</td>
<td>2.043</td>
<td>v 1 (1974) - present</td>
</tr>
</tbody>
</table>
Appendix C: Top Ten Business Finance Journals in JCR, impact factor and OSU Libraries' holdings.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Abbreviated Journal Title</th>
<th>ISSN</th>
<th>Impact Factor</th>
<th>Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><em>Journal of Finance</em></td>
<td>0022-1082</td>
<td>3.257</td>
<td>v. 1 (1946) - present</td>
</tr>
<tr>
<td>3</td>
<td><em>Review of Accounting Studies</em></td>
<td>1380-6653</td>
<td>2.606</td>
<td>v. 1 (1997) - present</td>
</tr>
<tr>
<td>5</td>
<td><em>Journal of Accounting Research</em></td>
<td>0021-8456</td>
<td>2.447</td>
<td>v. 1 (1963) - present</td>
</tr>
<tr>
<td>6</td>
<td><em>Accounting Review</em></td>
<td>0001-4826</td>
<td>2.185</td>
<td>v. 1 (1926) - present</td>
</tr>
<tr>
<td>8</td>
<td><em>Journal of Monetary Economics</em></td>
<td>0304-3932</td>
<td>1.379</td>
<td>v. 6 (1980) - present</td>
</tr>
<tr>
<td>9</td>
<td><em>Journal of Corporate Finance</em></td>
<td>0929-1199</td>
<td>1.312</td>
<td>v. 1 (1995) - present</td>
</tr>
<tr>
<td>10</td>
<td><em>Accounting Organizations and Societies</em></td>
<td>0361-3682</td>
<td>1.286</td>
<td>v. 17 (1992) - present</td>
</tr>
</tbody>
</table>
Appendix D: Top Ten Communications Journals in JCR, impact factor and OSU Libraries’ holdings.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Abbreviated Journal Title</th>
<th>ISSN</th>
<th>Impact Factor</th>
<th>Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>International Journal of Language and Communication Disorders</em></td>
<td>1368-2822</td>
<td>1.612</td>
<td>Not held</td>
</tr>
<tr>
<td>2</td>
<td><em>Public Opinion Quarterly</em></td>
<td>0033-362X</td>
<td>1.55</td>
<td>v. 1 (1937) - present</td>
</tr>
<tr>
<td>3</td>
<td><em>Journal of Health Communication</em></td>
<td>1081-0730</td>
<td>1.387</td>
<td>Not held</td>
</tr>
<tr>
<td>4</td>
<td><em>Human Communication Research</em></td>
<td>0360-3989</td>
<td>1.372</td>
<td>v. 12 (1985) - present</td>
</tr>
<tr>
<td>5</td>
<td><em>Health Communication</em></td>
<td>1041-0236</td>
<td>1.169</td>
<td>Not held</td>
</tr>
<tr>
<td>6</td>
<td><em>Journal of Communication</em></td>
<td>0021-9916</td>
<td>1.159</td>
<td>v. 1 (1951) - present</td>
</tr>
<tr>
<td>7</td>
<td><em>Media Psychology</em></td>
<td>1521-3269</td>
<td>1.152</td>
<td>Not held</td>
</tr>
<tr>
<td>8</td>
<td><em>Political Communication</em></td>
<td>1058-4609</td>
<td>1.118</td>
<td>Not held</td>
</tr>
<tr>
<td>9</td>
<td><em>Cyberpsychology and Behavior</em></td>
<td>1094-9313</td>
<td>1.061</td>
<td>v. 3 (2000) - present</td>
</tr>
<tr>
<td>10</td>
<td><em>Communication Research</em></td>
<td>0093-6502</td>
<td>1.056</td>
<td>v. 1 (1974) - present</td>
</tr>
</tbody>
</table>
Appendix B: Top Ten Economics Journals in JCR, impact factor and OSU Libraries holdings.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Abbreviated Journal Title</th>
<th>ISSN</th>
<th>Impact Factor</th>
<th>Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Journal of Economic Literature</em></td>
<td>0022-0515</td>
<td>4.667</td>
<td>v. 7 (1969) - present</td>
</tr>
<tr>
<td>2</td>
<td><em>Quarterly Journal of Economics</em></td>
<td>0033-5533</td>
<td>3.938</td>
<td>v. 1 (1886) - present</td>
</tr>
<tr>
<td>4</td>
<td><em>Journal of Economic Growth</em></td>
<td>1381-4338</td>
<td>3.24</td>
<td>v. 2 (1997) - present</td>
</tr>
<tr>
<td>5</td>
<td><em>Journal of Political Economy</em></td>
<td>0022-3808</td>
<td>3.194</td>
<td>v. 1 (1892) - present</td>
</tr>
<tr>
<td>6</td>
<td><em>Journal of Economic Perspectives</em></td>
<td>0895-3309</td>
<td>2.833</td>
<td>v. 1 (1987) - present</td>
</tr>
<tr>
<td>7</td>
<td><em>World Bank Research Observer</em></td>
<td>0257-3032</td>
<td>2.7</td>
<td>Not held</td>
</tr>
<tr>
<td>8</td>
<td><em>Journal of Economic Geography</em></td>
<td>1468-2702</td>
<td>2.519</td>
<td>Not held</td>
</tr>
<tr>
<td>10</td>
<td><em>Econometrica</em></td>
<td>0012-9682</td>
<td>2.402</td>
<td>v. 1 (1933) - present</td>
</tr>
</tbody>
</table>
Appendix F: Top Ten Management Journals in JCR, impact factor and OSU Libraries holdings.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Abbreviated Journal Title</th>
<th>ISSN</th>
<th>Impact Factor</th>
<th>Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>MIS Quarterly</em></td>
<td>0276-7783</td>
<td>4.731</td>
<td>v1 (1977) - present</td>
</tr>
<tr>
<td>3</td>
<td><em>Academy of Management Journal</em></td>
<td>0001-4273</td>
<td>3.353</td>
<td>v6 (1963) - present</td>
</tr>
<tr>
<td>4</td>
<td><em>Organization Science</em></td>
<td>1047-7039</td>
<td>2.815</td>
<td>v1 (1990) - present</td>
</tr>
<tr>
<td>5</td>
<td><em>Strategic Management Science</em></td>
<td>0143-2095</td>
<td>2.632</td>
<td>v1 (1980) - present</td>
</tr>
<tr>
<td>6</td>
<td><em>Information Systems Research</em></td>
<td>1047-7047</td>
<td>2.537</td>
<td>v1 (1990) - present</td>
</tr>
<tr>
<td>7</td>
<td><em>Administrative Science Quarterly</em></td>
<td>0001-8392</td>
<td>2.455</td>
<td>v1 (1956) - present</td>
</tr>
<tr>
<td>8</td>
<td><em>Journal of International Business Studies</em></td>
<td>0047-2506</td>
<td>2.254</td>
<td>v1 (1970) - present</td>
</tr>
<tr>
<td>9</td>
<td><em>Information and Management</em></td>
<td>0378-7206</td>
<td>2.119</td>
<td>v28 (1995) - present</td>
</tr>
</tbody>
</table>
Appendix G: Journals in which core faculty publish compared to OSU Libraries’ holdings.

<table>
<thead>
<tr>
<th>Journals in which core faculty have published</th>
<th>Current at OSU</th>
<th>Discontinued (Holding Dates Listed)</th>
<th>Not held at OSU</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>American Journal of Bioethics</em></td>
<td></td>
<td>2001-2006</td>
<td></td>
</tr>
<tr>
<td><em>Argumentation</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Biology and Philosophy</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Environmental Impact Assessment Review</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Genetic Testing</em></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><em>International Journal of Conflict Management</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Journal of Forestry</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Journal of Sustainable Forestry</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Law and Contemporary Problems</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Philosophy of Science</em></td>
<td></td>
<td>1934-2006</td>
<td></td>
</tr>
<tr>
<td><em>Public Affairs Quarterly</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Society and Natural Resources</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Trends in Ecology and Evolution</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Unasylva</em></td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Core faculty include Gregg Walker, Jonathan Kaplan, and Ursula Bechert.*
September 23, 2008

To: Ursula Susan Bechert
    College of Science
    2082 Cordley Hall

From: Robert Frost, Co-Chair
      Budgets and Fiscal Planning Committee

The Budgets and Fiscal Planning Committee of the Faculty Senate met in the spring and reviewed the CAT 1 proposal for the Graduate Certificate in Management for Science Professionals.

Prior to forwarding the proposal to the Curriculum Council, the committee had only a few specific requests. Please send a revised proposal to address the following:

1. Please provide a detailed budget that shows how funding would be utilized overall developmental phase and actual program operation. Specific attention should be given to:
   (a) identify the actual cost of instruction and administration for this certificate program;
   (b) make explicit where the sources for these costs would be coming from or subsidized from; and
   (c) include an e-campus aspect of this budget that shows development grant revenue, tuition revenue based on enrollment projections, expenditures, and how the e-campus budget relates to, or subsidizes, the on-campus version of this certificate program.

2. An indication of budget review/approval by COS Dean or appropriate staff would be helpful as well.

Once we've received the revised proposal, we will review it quickly. If you have any questions, feel free to contact me.

Cc: Becky Warner, Co-Chair, BFP
    Dan Dowhower, Academic Programs
    Vickie Nunnemaker, Faculty Senate
Becky, Robert:

I apologize for the delay in getting some answers to you about the CAT 1 proposal for the Graduate Certificate in Management for Science Professionals. The budget questions got passed to me, as the College has been the principal sponsor of the program since the end of the Sloan grant. I have tried to address the committee's specific questions below. I hope this will serve as an appropriate addendum to the proposal to address your questions.

Please provide a detailed budget that shows how funding would be utilized overall developmental phase and actual program operation. Specific attention should be given to:

- identify the actual cost of instruction and administration for this certificate program;

The Professional Science Masters program currently exists and is being delivered in conjunction with degrees in environmental science, applied physics, systematics, and biotechnology. The program costs currently committed include:

Program director, coordinator (0.5 FTE)
internship oversight, professional
development course $32,000 (+OPE)
Communication course: $5,000
Ethics/philosophy courses: $15,000
Management courses (3 x 2) and $30,000 (+OPE)
management course development $-
Biotech internship coordination (0.2 FTE) $17,000
Advertising, media, fundraising materials $7,500

The management courses already include delivery in Ecampus format, with one CRN number for on-campus students (i.e. through normal enrollment) and one CRN number for true distance students. The funds provided to Philosophy include support this year for delivery of the on-campus and an ecampus version of the course.

Addition of the fully online version will require addition of an additional section for the communications course ($5000-7000 depending on enrollment). As the program grows, the coordinator position will likely require an additional 0.5 FTE, either to one full-time position or two half-time positions to manage the internship coordination and oversight.

- make explicit where the sources for these costs would be coming from or subsidized from; and

The College of Science is supporting all of these costs excepting the costs for the biotech internship coordinator, which are provided by the College of Agricultural Sciences. The College sees the development of PSM as an important strategic step in developing the science and technology workforce the nation needs. We have been, and remain, committed to the costs of making the program go.
The support for the on-campus program will be ongoing, and provides a base that makes the implementation of a distance version much less costly. The reason to pursue a distance version is the emerging national interest in PSM. The development and delivery of the cohort curriculum, particularly the management component, is challenging. We have been a leader here and have an opportunity to provide a curricular program to other institutions that are trying to develop a PSM.

- include an e-campus aspect of this budget that shows development grant revenue, tuition revenue based on enrollment projections, expenditures, and how the e-campus budget relates to, or subsidizes, the on-campus version of this certificate program.

We are pursuing the Ecampus version of the program to:

1) increase opportunities for Oregonians to pursue the degree as many of our students are in companies now; an online component would facilitate their pursuit of the program, but would still require an on-campus stay, given the degrees we have

2) Provide a stand alone component that scientists and engineers currently employed could use to augment their skills in management and team projects

3) Provide a curricular component that other institutions (including those in Oregon) could use as building blocks for a PSM program

The additional costs for starting that online version are largely course development (these are included in the pending grant from Ecampus), delivery of an online section of the communications course ($7000) and an online version of the professional skills/case study course ($7000). In addition, the goal is to eventually recoup the costs of the online courses in ethics and management, and an appropriate portion of the internship coordinator position.

A pretty conservative budget projection for the program is:

Initial projections for PSM Online Certificate
This considers only students registered through Ecampus

Ecampus program costs:

<table>
<thead>
<tr>
<th>Course</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25 coordinator</td>
<td>22,880</td>
</tr>
<tr>
<td>Management courses</td>
<td>21,450</td>
</tr>
<tr>
<td>Communication course</td>
<td>7,000</td>
</tr>
<tr>
<td>Ethics Course</td>
<td>7,000</td>
</tr>
<tr>
<td>Advertising/media</td>
<td>5,000</td>
</tr>
<tr>
<td>Professional Skills Course</td>
<td>7,000</td>
</tr>
<tr>
<td>0.1 Internship coordinator</td>
<td>8,500</td>
</tr>
</tbody>
</table>

Total: 78,830

(The coordinator and management course positions incur OPE)
<table>
<thead>
<tr>
<th>Student Cohort</th>
<th>Annual Credits</th>
<th>80% Ecampus Tuition</th>
<th>(Subsidy)/Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY09</td>
<td>5</td>
<td>30</td>
<td>8,362</td>
</tr>
<tr>
<td>FY10</td>
<td>20</td>
<td>120</td>
<td>33,408</td>
</tr>
<tr>
<td>FY11</td>
<td>35</td>
<td>210</td>
<td>58,464</td>
</tr>
<tr>
<td>FY12</td>
<td>60</td>
<td>360</td>
<td>100,224</td>
</tr>
</tbody>
</table>

The student cohort is the number of students enrolled in the program. We have assumed those students will take only 2 of the 6 program courses in a given year. This would be characteristic of students working while pursuing the certificate. Students pursuing this as part of a PSM degree at another institution will likely take the full six courses in a year, but we’re being conservative. Once student numbers reach this level, the coordinator position for this part will likely need to increase another 0.25 FTE for a total of 0.5 FTE.

We have been quite conservative here, assuming that most students will pursue this part-time. This is consistent with what we see in current Ecampus use and is the most likely current audience. As the visibility of PSM programs increases, we expect to see significantly more growth in students pursuing the program full time in conjunction with other university PSM programs.

The immediate fiscal goal is to cover costs related to this part of the program. When fully successful, the program will also create net revenues that will be used to expand the curriculum to be more closely tailored to specific audiences (we already have requests for one of the management courses to focus on regulatory requirements and processes for example; we just don’t have the student base yet to create such course diversity).

- An indication of budget review/approval by COS Dean or appropriate staff would be helpful as well.

This program has the full support of the Dean and the College. We are committed to underwriting the costs of this program until the student numbers are such that it is self-sufficient. We remain committed to the on campus version of the PSM as well and are actively working to expand the number of degree options available to students.

Please let me know if you have other questions.

Best regards,
Sherm